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I

A PROBLEM IN ARTICULATION

THE PRIVATE SCHOOL CURRICULUM AND THE WOMEN'S COLLEGES

One of the most unsatisfactory points in the education of girls today, in the eastern section of the country at least, is the so-called "articulation" between the private school and the college. In these days of universal education it is odd, but true, that one of the classes of pupils most seriously handicapt in carrying out any ambitions for higher education should be the daughters of many families of means and social position. It is often far harder for such a girl to obtain a college education than it is for the daughter of a poor shopkeeper on the East Side. It is not the principals of the private schools who are at fault, but the general system and the psychological and social peculiarities of a certain portion of the community.

In a private secondary school for boys, like Groton or St. Paul's, the problem is simple. Practically every pupil is preparing for college. In a private school for girls, on the contrary, it is necessary to provide a double curriculum—college preparatory and general. A girl is asked to decide, at the age of about fourteen or fifteen, whether she is going to college or not. If she plans to go, she is given for several years, special training in practically all her subjects to fit her for the college entrance requirements. The girls in the general course, meanwhile, are given a broader, less concen-

trated, and perhaps less thoro curriculum, in the difficult attempt to provide them, by the age of seventeen or eighteen, with a finished education sufficient to fit them for positions of influence and responsibility in the complex world of the present.

It is very frequently impossible for a girl to decide, at the age of fourteen whether she really wants to go to college or not. She often decides for frivolous reasons. Perhaps her intimate friend does not like Latin; perhaps her eighteen-year-old brother disapproves of higher education for women. Frequently her parents have a vague prejudice against colleges for women, or do not wish to have their summer plans interfered with by having to wait around for the Board Examinations in June. The result is that many an excellent and ambitious student at the end of her school course, or within a few years afterwards, bitterly repents her decision. After the first excitement of coming out, the joys of society pall. She wants to take up some line of work which requires a college education, or she wants the inspiration towards a definite choice of work or interest which she hopes college can give her. But in no subject has she really qualified for college entrance. If she is thoroly determined and energetic, she heroically turns back, reviews or begins Latin, grammar, algebra, and the other requirements, and enters with the regular freshmen. Some of our very best and most interested students at Barnard have been of this sort, entering at the age of twenty-one, twenty-five, or even later. Most girls, however, especially in the face of parental discouragement, lack the strength of mind to attack this hard, elementary work, and they turn regretfully away from our college doors, to continue their aimless drifting.

Besides presenting this serious difficulty to many pupils, the double curriculum is often undesirable for the school. It is expensive to operate and inconvenient. One of the most prominent boarding schools in this section of the country has recently announced that it will give up its college preparatory course, and it is dissuading its pupils from trying college entrance examinations. Thus a girl

whose parents send her to this school is practically cut off from chances for a higher education.

Another difficulty encountered by some private schools is the holding of the pupils in the general course to a severe standard of hard work, accuracy, and concentration. If a girl's family does not take her education very seriously, and if the girl herself has no definite ambition and does not look forward to any special goal or any test which she must stand up and face, she is in some danger of lapsing into a kind of mental flabbiness. She may never really put forth her best effort or develop her latent ability.

To help correct these various faults, it seems obvious that some attempt should be made to adjust the college entrance requirements and the private school curriculum and standards so that any able student, on graduating from a good school, will automatically be prepared for college—at least in the great majority of her subjects—and may enter if she so desire, then, or a year or two later, as she prefers. The making up of the few subjects which she may lack will not be difficult.

It would evidently be desirable to have examinations given by some outside examining body in all good private schools, to be taken by all able pupils at the ends of the last two or three years of their school course, irrespective of whether they have planned to go to college or not. These tests should not, therefore, be such as to require peculiar cramming, but should be fair measures of good, general courses in the subjects in question, suitable for a non-college as well as a college preparatory pupil. They would insure the maintenance of high standards in the school work and give the girls a definite goal at which to aim. They might be required by the schools for graduation or at least for certain honors. They should be accepted by the women's colleges for entrance credits.

For some years a few schools have used the Bryn Mawr entrance examinations in this way, arranging their curriculums to lead up to these tests which they required for graduation. The date of these examinations, the end of May, is

convenient for this purpose, but their nature is regarded by many principals as somewhat unsuitable for general tests.

The examinations of the College Entrance Examination Board, to which one would naturally turn, are held at a date which makes them almost useless at present for the general purposes here described. For social or climatic reasons, most of the schools concerned with these problems close about the end of May. It is impossible for them to hold their pupils until the middle of June, or induce them to return for tests. This may sound frivolous, but it is a very real and apparently insuperable obstacle.

In May, 1915, an experiment was conducted by Miss Spence's School and Barnard College, to see how well adapted for general tests were the regular Columbia University Entrance Examinations, how nearly the quality of college entrance work coincided with that of the general course in a good school, and what adjustment, if any, would have to be made in the subject matter and the quality of our entrance requirements to bring about a better articulation between private school and college. The Columbia University Committee on Admissions arranged a special series of entrance examinations, which were given in the school, beginning May 18, the week before the school commencement, and managed in the same way as the regular January or September examinations of the University. Forty-four pupils took these examinations in one or more subjects. Only four of them had been preparing for college. The others had had no special training for the examinations. They did not even know they were to take them until five days before the first test, when the school was told by the principal that certain pupils who had obtained grades of A in their work would be allowed, as a special honor and privilege, to try Barnard examinations in the subjects in which they had done well. The girls were delighted, and apparently greatly enjoyed trying the examinations.

The results seemed to the Barnard authorities astonishingly good. They apparently showed that, in many subjects at least, our entrance examinations are fair tests of a good,

general school course, which the pupils may take "in their stride," without special preparation. The achievement in modern languages was especially good. Out of sixteen taking Elementary German, ninety-seven per cent past; out of thirty candidates in Elementary French, eighty-seven per cent past. The new entrance requirements in English seem to be well adapted to a general school course. In English 1, Grammar and Composition, out of twenty-three candidates, seventy-eight per cent past; and in English 2, Literature, out of twenty-two candidates, seventy-seven per cent past. These results might perhaps have been expected; but even in the great stumbling blocks, Latin and Mathematics, some excellent averages were obtained. In Plane Geometry, out of nineteen candidates, seventy-nine per cent past. In Cicero and Sight Translation of Prose, seventy-five per cent past. In some of the other subjects, the percentage passing was considerably lower, but this was frequently due to the fact that candidates were trying a subject which they had studied the year before and had not reviewed.

The experiment apparently showed that, with some slight readjustment, it would be perfectly practicable in any good private school for girls, to have every pupil of high grade, before her graduation, secure credit in college entrance examinations for at least the great majority of subjects required for admission, and to have her do this without being registered in a special college preparatory course, or sacrificing the cultural subjects desirable for pupils who do not go on with higher education.

For some time before this experiment was conducted, these problems of the private school had been thoughtfully considered by the Head Mistresses Association, an organization made up of the principals of many of the best private schools for girls in the East, and devoted to an energetic and intelligent effort to improve the quality of the education of girls. The Academic Standards Committee of this Association warmly advocated the introduction of some general system of examinations by an outside authority, which might be used for school graduation and for college entrance,

and which would, so they thought, greatly aid the schools in maintaining a high standard of work.

On conferring with representatives of the College Entrance Examination Board, the Committee found that that organization did not at present deem it practicable to conduct a special series of tests in May for the private schools for girls. Such an undertaking would obviously involve many new complications in the Board's already elaborate machinery. Recognizing that the Barnard College examinations, conducted by Columbia University, were as nearly as possible adjusted to the standards of the Board, the Head Mistresses Association requested Barnard College to arrange for the members of the Association a series of May examinations. With the desire to cooperate in trying to solve this educational problem, Barnard College agreed to do this tentatively for 1916, thru the Columbia University Committee on Admissions, with the hope that the Board, or some other general body, might assume the burden later on. Accordingly, a set of examinations beginning on May 16, were given in 1916 not only in Miss Spence's School, which successfully continued its plan of the previous year, but also in six other schools of the Association. Smith, Vassar, and Wellesley agreed to accept these tests for entrance. In all, 125 pupils were examined. The results were, upon the whole, very satisfactory.

Meanwhile the problem was made more urgent for the schools, tho in some ways simpler, by the announcement, in the spring of 1916, that Mt. Holyoke, Smith, Vassar, and Wellesley, after a series of conferences, had agreed to give up the old certificating system of admission and to adopt an examining system. This new plan requires four "comprehensive examinations" combined with a school record for all subjects. Candidates are, however, permitted to offer instead the old style of examination in all subjects. Now that all their pupils who wish to go to Mt. Holyoke, Smith, Vassar, and Wellesley, as well as those looking towards Barnard, Bryn Mawr, and Radcliffe, must take examinations, the schools are naturally even more anxious than before to have a series of tests available at some date in May.

What the next step in this adjustment will be is not yet apparent. The College Entrance Examination Board still has under consideration the request of the schools for May examinations. There is naturally some reluctance to recognize the impossibility of having these candidates use the regular June series, and to encourage, by granting an earlier set, the shortening of the school year. Various difficult administrative complications are also involved in the giving of May examinations. It is hard to arrange a date acceptable to all schools. Those dealing chiefly with pupils definitely planning to go to college are apt to want the examinations after their commencements. Those concerned with pupils not definitely committed to college wish the tests before their commencements, as do also the schools desiring to use these examinations for graduation. The last class present a most difficult problem, for it is extremely hard, as Barnard College has found, to get the papers read quickly at a time of year when college instructors are busy with their own courses. The ideal of a school holding its commencement on May 29 would naturally be to have the tests end on May 27 and the reports in by May 28. But this is obviously an impossible dream. It will be very difficult to arrange to get the marks reported to the school in time to determine graduation, without holding the tests so early as to shorten very materially the already scanty school year.

When we have worked out, as we surely must, some machinery for giving in the private school at a convenient date these much-needed examinations, we shall have taken an important step towards the solution of the problems at present facing the girl of a certain class in our community. We must then induce most private schools to avail themselves of this machinery. We must also, to improve still further the articulation between school and college, consider the possibility of making more elastic, in quality of test and range of subject, our college entrance requirements, without, of course, lowering our standards. Perhaps the new type of examination called "comprehensive" will prove a fairer test of a general school course than is our old form.

Already the college requirements offer a fairly wide range of subject matter. In Barnard, for example, a candidate can gain credits not only for a considerable variety of languages, histories, and sciences, but also for drawing, for the appreciation of music, and for harmony. Whether it will be possible to give examinations and assign credits for subjects not now in the standard college lists, such as psychology and the history of painting, as some schools request, we shall have to consider carefully and with open minds.

The problems which have been here discust concern, it is true, only a comparatively small group of pupils, a mere drop in the great sea of our educational statistics. But they are, in proportion to their numbers, an important group, destined, many of them, to occupy positions of wide influence; able, thru wealth, social experience, and connections, to make their ideas and ambitions tell. Whatever form their education is to take, surely they and their parents should be induced, if possible, to regard it as a serious matter, fully as important as that of their brothers. Meanwhile we should hold out to them an encouraging and helping hand. We do much, in the way of free schools and scholarships, for the girl of poor parentage. Our sympathies should go out, also, to the occasional girl of means, hampered by the social customs and conventions of her circle, struggling in the face of great difficulties toward serious interests and usefulness and toward intellectual light. Even at the cost of some readjustment of our educational machinery, we should try to aid her. Much can be accomplished for her by a better articulation between the private schools for girls here in the East and the colleges for women.

VIRGINIA C. GILDERSLEEVE

BARNARD COLLEGE
COLUMBIA UNIVERSITY

II

STANDARDIZING THE MARKING SYSTEM

The marking system in the colleges of the United States is in a state of transition. The traditional system of percentages has been largely abandoned in favor of a group system, but this, in turn, is still based almost altogether on percentages, and the groups are generally arranged in a purely arbitrary fashion, with little effort to make them conform to the law of averages. Several articles have been written to show the advantages of a rational or scientific system of marking, and the experiment is being tried in a few institutions, notably at the University of Missouri, but most of the colleges still cling to a combination of the percentage and the group system, which frequently combines the bad qualities of both. Unfortunately, few colleges have hit on the same combination, and the result is chaos. In fixing the status of a student admitted from one institution to another, it is impossible to judge of the character of his previous work until a statement of the marking system of the first college is presented, and this must frequently be supplemented by elaborate explanations before a just decision can be reached. It was this consideration that led the National Conference Committee on Standards of Colleges and Secondary Schools to plan a study of the marking systems of the colleges, the results of which are published in tabular form as an appendix to the *Minutes of the Conference* of March 24, 1917. (Copies of the *Minutes* and of the tabular exhibit may be obtained from the undersigned, the Secretary of the Committee.) The purpose of this article is to show the diversities that exist in a number of representative institutions, not to suggest a method of standardization. The latter will come in time; that it has not yet been attempted is due to lack of appreciation of the condition which this study has brought to light.

The colleges selected for examination are those approved by the Carnegie Foundation. Replies were received from sixty-four. It is no exaggeration to say that there were discovered to be in existence just about as many different systems of marking as there were colleges studied. Two groups of four colleges each, and one group of two colleges, have apparently the same system of marking, but there the similarities end.

I. THREE GROUPS ABOVE PASSING

Beginning with the colleges that are most vague and general in their marking, and proceeding to those that are extremely particular, we note first a group of four institutions that recognize only three grades above passing. The University of Michigan and the Brooklyn Polytechnic Institute have three grades, designated A, B, and C, which are regarded as satisfactory. The pass mark at the Polytechnic is fixt at seventy-five per cent, otherwise percentages are not employed; marks of D and E are given for failure and bad failure, respectively. At the University of Michigan no definite percentage values are established. The mark D indicates deficiency, not total failure; the "point-credit" system, to be discust later, is employed, and the treatment of D varies in the several departments. In the Medical School and in some others, D is regarded as a removable condition; it may be raised by subsequent examination, and must be raised in order to give credit; in the College of Literature, Science, and the Arts it is a fixt mark, giving credit but no points. The Massachusetts Institute of Technology has also three passing grades: C, past with credit; P, past satisfactorily; and L, past with low standing. Percentages, if used, are limited to multiples of five; C is associated with seventy-five per cent or over; P, sixty to seventy-five per cent; and L, fifty-five per cent. The mark L on a condition examination is not regarded as satisfactory, hence the passing grade is in a sense limited to the record of sixty per cent. There are two marks of failure, F and FF; as is generally the case with two marks of failure, F allows a make-up examination,

FF means that the course must be repeated. Finally, at the University of Pennsylvania we find D, G, and P used to distinguish passing grades, N and F failure. There is no numerical equivalent for these letters.

II. THREE GROUPS, AND A CONDITIONAL FOURTH

Two institutions have three grades above pass, a conditional fourth grade, which may be raised on re-examination, and one grade of failure. The University of California uses the figures 1–5 to indicate the grades, no percentage values being officially recognized, tho the impression is that most instructors consider first grade to represent 85 per cent (some say 90 per cent) or better, second grade 75–85 per cent, third grade 60–75 per cent, fourth grade 50–60 per cent, and fifth grade below 50 per cent. Purdue University uses the letters A, B, and P to indicate the three higher grades, C is the conditioned grade, and D indicates failure, below 50 per cent. The valuation of the higher grades in percentages is: A, 90–100; B, 80–90; P, 70–80; and C, 50–70.

III. FOUR GROUPS

By far the largest number of colleges, thirty-six in all, employ four groups above pass, and either one or two groups to indicate failure. But the symbols used, and the percentage values assigned, if any, vary greatly. Bowdoin, Trinity, Bates, Wabash, and Rose Polytechnic agree in the use of the letters A, B, C, and D to indicate the four passing groups, and assign to them the respective values of 90–100, 80–90, 70–80, and 60–70 per cent. The mark of failure in all cases is E (except at Bates, where it is F), and the passing mark is 60 per cent. The University of Vermont follows the same method, except that X is the mark of failure, instead of E. Centre, Lehigh, Dickinson, the University of Cincinnati, Worcester Polytechnic, and Amherst use these five letters, with the same respective percentage values, but with the addition of a second grade of failure, F, which at Lehigh is defined as below 40 per cent, at the University

of Cincinnati, below 50 per cent, and at Worcester Polytechnic, below 45 per cent. At Amherst the average grade in all courses is communicated to students by percentages, the marks in individual courses by letters. Swarthmore and Wellesley have the same four passing grades, with the same percentages, but the two grades of failure at Swarthmore are designated Cond. and E, the former being used to indicate either incomplete work, or unsatisfactory work in a semester course in which the condition may be removed by doing satisfactory work in another semester course in the same subject, or in the second semester of a year's course; while at Wellesley there are three grades of failure, E denoting condition, F, heavy condition, and G, very heavy condition. At Union the professors report to the college office exact percentages and these marks are entered on the college records, but reports to students are made in grades, with four passing groups and two groups of failure. The passing groups, however, are not indicated by letters but by numbers 1, 2, 3, and 4. The marks for failure are N. S., not sustained, meaning that the student is conditioned, and failed, meaning that the subject must be taken over in class. Tulane has four passing grades, A, B, C, and D, with one failure grade of E, but differs from the other colleges in that the passing grade is 70, instead of 60, and the four passing grades are valued in percentages as 95–100, 90–94, 80–89, and 70–79. Four other colleges have the same system of four groups above passing, A, B, C, and D, but assign unusual percentage values; the percentage value of each of the four groups, beginning at the lowest, D, is at Washington University 60–69, 70–84, 85–94, 95–100, at Williams, 50–62, 63–74, 75–87, 88–100, at Lawrence, 70–77, 78–84, 85–90, 91–100, and at Franklin, 70–79, 80–87, 88–95, 96–100. Williams and Lawrence have only one mark of failure, E, but the passing mark at Williams is 50 per cent, at Franklin, 70 per cent. Washington University and Franklin use both E and F for failures. It is not the policy of the University of Wisconsin to give information to students respecting their numerical marks. Neither numbers

nor letters are used here to indicate groups, but the scale of marks runs: 93–100, excellent; 85–92, good; 77–84, fair; 70–76, poor; 60–70, conditioned; below 60, failed. The marking system at Adelbert is based upon the percentage system, but grades are reported by instructors in letters, E (Excellent), 90–100; G (Good), 80–90; F (Fair), 70–80; P (Past), 60–70. The marks of failure are D (Deficient, *i.e.*, conditioned with privilege of re-examination) and X, which indicates failure (below 40 per cent).

All the colleges so far considered, of this group that employs four grades of passing, assign a certain percentage value to each group. There are a number of other colleges that have four passing groups to which no percentage value is assigned. If when the group system was adopted a definite percentage value was assigned each group, this scale has been forgotten or is intentionally disregarded. Thus, Harvard, Radcliffe, Dartmouth, and Grinnell use the letters A, B, C, and D for passing groups, and E for failure, without any assignment of percentage values. So also the University of Minnesota, Hobart, Vassar, the University of Colorado, and Cornell University, but these have an additional failure grade of F. Leland Stanford, Jr., has also two groups of failure, A, B, C, and D being used to indicate passing, but instead of letters the words conditioned, and failed, are apparently used. To add to the confusion regarding the mark of failure, Columbia, with an A, B, C, D system, uses only one mark to indicate failure, but that is F, not the usual E. Three other colleges follow the same system as described above, with four passing groups and one group of failures, but use peculiar methods of designation, Wesleyan employing figures 1, 2, 3, 4, with 5 to indicate failure, Tufts using the letters A, B, C, and L, and the University of Missouri the letters E, S, M, and I, with F for the failure mark.

IV. FIVE GROUPS

There are three colleges that use five groups above passing. Washington and Jefferson, in addition to groups 1, 2, 3, and 4, has a group H, reserved for those of the highest rank.

Percentages are not employed, and failure is indicated by N. P. Princeton and Rochester use figures to indicate the groups. At Princeton, group 1 represents a percentage of 87–100, group 2, 77–86, group 3, 67–76, group 4, 58–66, group 5, 50–57. Failures are reckoned as group 6. The corresponding percentage figures for Rochester are 90–100, 85–89, 80–84, 70–79, 60–69. There are two groups of failure, group 6 (40–59) and group 7 (0–39). The Rochester catalogue contains an elaborate statement of the definitions which determine a student's rank in any one of the several groups. It is an interesting psychological study, but it may be questioned whether the finely drawn distinctions between the several groups are universally applicable. For instance, the definition of group 3 reads in part: "The student has frequently shown thoro comprehension and accurate reproduction, without much power of correlation or of original reaction, but his work has been moderately irregular. He has been uniformly conscientious but not uniformly successful. His failure to reach group 2 may be due to mental limitations, poor preparation in lower schools, or pressure of other work, not to continued neglect or indifference." The Dean in a letter refers to the satisfactory effect on the students of these very candid statements.

V. SIX GROUPS

No mention has been made so far of plus and minus signs. In the colleges so far mentioned these are used sometimes, but apparently not officially. Instructors occasionally put them on their reports, but the office does not record them. In the colleges now to be considered, plus and minus signs are a part of the official record, with the result, of course, of increasing the number of groups. Thus, Knox and Wells have six groups above passing, but the former gets them by using the minus sign (A, A—, B, B—, C, C—), and Wells by using the plus sign (A+, A, B+, B, C+, C). Knox does not employ the percentage system; Wells makes the lower limit of the six groups, respectively, 70, 75, 80, 85, 90, 95. Each has one grade of failure.

VI. EIGHT GROUPS

Again, two colleges, Drake and Oberlin, employing four letters, A, B, C, and D, to indicate passing, and using the plus sign, group their students in eight grades, each college having also two grades of failure, E and F. Their percentage valuations are, however, quite different. Drake makes group D begin at 60 per cent, and each group above is five per cent higher, while Knox begins group D, the lowest passing, at 62 per cent, and the other groups have the following lowest percentages: 67, 72, 77, 82, 87, 92, and 98.

VII. NINE GROUPS

Two colleges have nine groups above passing. At Coe College A, B, and C are the passing grades, and professors use their discretion in regard to dividing these grades by the use of plus and minus signs. The practise is, however, almost universal in the faculty. D is used to indicate conditional failure, to be made up by attaining a higher grade in subsequent work; E marks absolute failure, to be made up before the student is advanced in the subject. Johns Hopkins uses a system of percentages and groups, and employs figures instead of letters. The marks given are 10, 9.5, 9, 8.5, etc., which are interpreted to mean: 10, excellent; 9, very good; 8, good; 7, fair; 6, past; 5.5, failed, and so on.

VIII. TWELVE GROUPS

Six colleges, by the use of A, B, C, and D, with both plus and minus signs, make twelve groups above passing. At Smith, no percentage values are assigned the several groups; at Clark College, Carleton, Ripon, Mount Holyoke, and Indiana University, various percentage values are assigned the several groups, which do not agree in any two cases. Clark and Smith use E to indicate failure; Carleton, X and F; Ripon, X and Z; Mount Holyoke, E and EE; and Indiana University, conditioned, and failed. (Clark University has no marking system. President Hall writes: "All this puerile school business we feel is utterly out of place in a post-graduate institution.")

IX. FIFTEEN GROUPS

In reports to the Recorder, Beloit College uses AA, A, B, C, and D to indicate passing, all with plus and minus signs, which makes possible fifteen groups. The reports to students and parents, however, are simplified, tho at the cost of still further complicating the nomenclature of the marking system in the colleges, by using the symbols H (passing with honors grade), P (passing with credits), D (merely passing, no credit), F (failure, with privilege of re-examination), and FF (failure, without such privilege).

X. PERCENTAGE SYSTEM

In the fifty-eight colleges hitherto considered, the group system, with from three to fifteen groups above passing, has been shown to constitute the basis of marking, with more or less reference to percentages. In five of the remaining six colleges, the percentage system is used, namely, at St. Lawrence, Case School, University of Virginia, Stevens Institute, and Drury, altho at Case the group system (A, B, C, D) is used in handing in the monthly grades to the office, and at Drury the grades are given to the students by groups, A = 93 – 100, B = 85 – 92, C = 78 – 84, D = 70 – 77, E = 60 – 69, F = 0 – 59. The passing mark is 70. A peculiarity of the Drury system is that fractional grades are entered on the registrar's books, *e.g.*, 85⅔. The contrast between this method and that of the four colleges first mentioned in this paper, that employ only three groups above passing, serves to show the wide variation between American colleges in their marking systems.

Finally, as is well known, Yale still clings to her scale of 4 or 400. Tradition says that the marking books were printed in squares, and that the four corners were used to indicate the four different marks, everything above the middle line being above 200, and everything under the line below the passing grade. The high mark is 350, since it is very unusual for a man to get more than that rating, altho the theoretical maximum is 400. Yale also has a letter

system; 330 is grade A (Phi Beta Kappa); 300–329, grade B; 260–299, grade C; and 225–259, grade D. No plus or minus signs are used after these letters, and the actual mark is given if it is desired to indicate the grade more accurately.

QUALITATIVE REQUIREMENT FOR GRADUATION

For a number of years the best colleges have refused to graduate a student who has merely completed the required number of hours, most of them with low grade, and by various methods have insisted that a certain proportion of grades must be above mere passing. The point-credit system is employed in a number of institutions. At the University of Michigan, for example, each hour of A grade gives, besides one hour of credit, three points; each hour of B grade, two points; of C grade, one point; D grade gives no points; a grade of E gives neither credit nor points. For graduation, 120 hours of credit and 120 points are required, that is, hours of D grade must be balanced by those of higher grade. The result is practically to require an average of C for graduation. Precisely the same method is employed at Leland Stanford, Jr. (except that a plus sign adds one grade-point per unit), at Lawrence, Ripon, and Swarthmore (except that 124 hours of credit and 124 points are required instead of 120). Carleton College also has a system of grade-credits ensuring an average of C for the course. A slightly different system is that of Hobart, where the four higher marks carry with them a respective point-credit of 4, 3, 2, and 1. The points required for graduation are of course higher in this case, 215 being required to accompany 120 semester hours of credit (the quantitative requirement). Yale gives a point of credit only on a course past with a grade of 225 or better; grades between 260 and 299 give the student two credit-points per hour, 300–329 gives three points, and 330 or better gives four credit-points per hour. A Yale student must have as many points of credit as he has hours for graduation. The result of the Yale system is that a man must do a good part of his work at grades of C or D in order to make up for his marks that are below 225. Dartmouth

also weights the four higher grades respectively, 4, 3, 2, and 1, requiring 122 semester hours for graduation, and 220 points. At the University of Wisconsin, as many points are required for graduation as credits. For grade excellent, three points are awarded per hour; for grade good, two points; for grade fair, one point; for grade poor, no points. The maximum number of points that can be secured by a student graduating in a course which requires 120 hours is 360, the minimum is 120.

The system at the University of Rochester is as elaborate as the statement of definitions of grades already referred to. "A student who passes a course above the fifth group of scholarship shall receive an addition of five per cent of his total points of credit for that course, if his final grade is in the fourth group, ten per cent in the third group, fifteen per cent in the second group, and twenty per cent in the first group. But for each absence from class, five-hundredths of one point shall be subtracted from the student's points of credit for the course in which the absence occurred. If at the close of a year a student's points of credit for that year amount to less than the number of hours taken, such deficiency, with any accumulated deficiency from a previous year, shall be made up by taking an additional course or courses during the following year. No student shall be graduated with a total credit of less than 184 points." One infers that the registrar of this institution is a good mathematician and a very busy man.

The system of credit-points originated at the University of Missouri, and is often referred to as the Missouri System. It is applied somewhat differently there, and is not employed in all the departments, the faculties in technical and professional schools as a rule not finding it adaptable to their conditions. In Arts and Sciences, students are allowed normal credit for work of M grade; the credit is reduced fifteen per cent for work of I grade, and increased fifteen per cent for work of S grade; the occasional E grade is worth thirty per cent more credit than the normal. Under this system the mediocre, hard-working student must spend four years

to secure the A.B. degree, whereas a student who could make E grade in every subject might graduate in three years. Only one student in nine years has been able to do this, but a number complete the work for the degree in three and a half years, remaining in practically all cases the additional semester for graduate work.

Another method of securing quality as well as quantity for graduation is to require that a certain proportion of a student's marks must be above a mere passing grade; it follows that by fixing a high proportion a higher standard may be set under this system than under the point-credit system, which generally calls for merely an average of C, or medium grade. Thus Adelbert and Grinnell colleges require that three-fourths of a student's grades be C or better; Harvard, Radcliffe, and Centre colleges set the requirement at two-thirds; Tufts and Wesleyan demand sixty per cent of grades above mere passing; Smith requires that sixty-four hours, a little more than half, be of C grade or better, and Knox will not count more than forty per cent below the grade of B– (fourth of six passing grades); Colorado College insists that a majority of the student's grades be above seventy (the passing mark is sixty); Bowdoin requires grade C in more than half the student's marks, and the University of Vermont, Williams, Cornell University, and Mount Holyoke expect grade C or better in at least half the work; Amherst, Drake, and Vassar fix the requirement at a general average of C, and Washington University calls for an average of C in the junior and senior years. Clark College allows not more than twelve semester hours of D to count, and Columbia allows D to count in only one course for a semester, while the University of Cincinnati accepts not more than six hours of D grade in a semester. Wellesley requires a grade of C or better in six hours the first semester and in nine hours in each succeeding semester. At Bates College, a student's grades at the end of the freshman year must average sixty per cent, if he is to remain in college; at the end of subsequent years, an average of seventy per cent is required.

It is evident from this investigation that there is work for the National Conference Committee, or for some other organization, in standardizing college grades. The individual colleges will do nothing themselves, as most of them are satisfied with their marking systems, and do not feel the need of cooperating with others. There is much to be said in favor of many of the systems described above; from a careful study and comparison of them it ought not to be difficult to elaborate a system which would be acceptable to all, and which would at the same time be rational and scientific.

FRANK W. NICOLSON

WESLEYAN UNIVERSITY
MIDDLETOWN, CONN.

III

METHODS OF ADMISSION AND COLLEGE RECORDS

The Association of Colleges and Secondary Schools of the Middle States and Maryland at its meeting in 1913 appointed a committee to investigate the comparative records made in college by students admitted by certificate and by examination respectively.

The committee presented a preliminary report in 1914 in which it reviewed the literature of the subject, outlined the plan of work and reported the results of an investigation into the records of students in Princeton, Columbia, and Johns Hopkins Universities. In 1915 it presented a second report presenting the results of a study of the records of students in Mount Holyoke, Smith, Vassar, and Wellesley colleges. (See Proceedings of the Association for 1914 and 1915.)

The problem is one of exceeding difficulty tho the difficulty may not be evident at first sight. It can not be solved by a simple comparison of the records made by students in examining colleges with those of students in colleges admitting by certificate since there can usually be no certainty that the academic standards of different colleges are the same. A large percentage of failures might mean high academic standards or poor teaching instead of inferior preparation. On the other hand, the comparison of records made in a given college by students admitted by the two admission systems respectively might also be very misleading; it has sometimes been said that in some colleges admitting by certificate, examinations are so badly administered as to serve merely as a back door for students who can not obtain certificates. In any case there would be an adverse selection of the group taking examinations for admission to such colleges. Ordinarily, the student who takes examinations

for admission to one of these colleges would come from a school which has not been able to obtain the certificate privilege or has an individual record too low to entitle him to a certificate. A good examination system would weed out the weak ones, but where the certificate is the normal method of admission there is a presumption against the thoroness of the examinations in all but the strongest colleges.

The plan adopted by the committee was as follows: To select colleges of known and unquestioned standing and to combine the two methods suggested above. More specifically we undertook to obtain from a few colleges admitting only by examination the records of one or more classes; to divide each class into three groups, the first admitted without conditions, the second with a few conditions (two units or less) and the third admitted with more than two units of conditions. The percentage of failure in each of these groups for each of the first two years and percentage graduating in the highest, middle, and lowest thirds of their classes respectively would show whether the method of admission was in harmony with the standards of the college. If the quality of the college work should prove to be closely correlated with that of the entrance record the presumption would be in favor of the soundness of each provided, of course, that the percentage of failures were not too high thruout.

The results in these colleges would serve as a standard for comparison for students admitted either by examination or by certificate to colleges employing both systems. In colleges of the latter type the students admitted by the two systems were similarly divided into three groups. One advantage of this division is to be found in the fact that even if the examinations were not very good they would probably not, as a rule, permit students to enter without conditions who were markedly inferior to those admitted with conditions. The students admitted without conditions by this method would presumably be comparable with those similarly admitted by certificate.

The data thus obtained would then permit a comparison of students admitted by examination to colleges not accepting certificates, students admitted by the same method to colleges which did accept certificates and students admitted by certificate. The highest, middle, and lowest groups at entrance (so far as completeness of preparation is concerned) could be compared with each other and with similar groups in other classes.

To supply such data requires much time and labor on the part of college officers and the committee was not surprized to find that many were unwilling to undertake to furnish them. In two important instances colleges declined on the ground that their own systems were unique and the results could, therefore, be of no value. The committee protested against this excess of modesty but was unable to overcome it.

The preliminary report gave the results for a class of 342 members at Princeton, for 205 at Columbia, and for 110 at Johns Hopkins. The results for the first two are shown in the following tables:[1]

COLLEGE X

Dropt for Poor Scholarship

	Freshman Year Per cent	*Sophomore Year Per cent*
No conditions	3	4
Two units or less	12	13.3
More than two units	36.9	15.2

Percentage of graduates in

	First Third Per cent	*Second Third Per cent*	*Lowest Third Per cent*
No conditions	43	41	16
Two units or less	35	38	27
More than two units	[2]31.5	47.2	21

[1] The facts presented in this and the following tables are also represented graphically in the Proceedings of the Association of Colleges and Preparatory Schools of the Middle States and Maryland for 1915.

[2] Only a small number graduated.

COLLEGE Y

Dropt for Poor Scholarship

	Freshman Year Per cent	*Sophomore Year Per cent*
No conditions	0	0
Two units or less	6	0
More than two units	21	46

Percentage of graduates in

	First Third Per cent	*Second Third Per cent*	*Lowest Third Per cent*
No conditions	49	32	19
Two units or less	25	38.3	36.7
More than two units	3.2	29	67.7

The percentage of failures in X is higher but the correlations are the same. In each college the heavily conditioned group makes the worst showing, the unconditioned the best. The latter loses few or no members for poor scholarship and graduates a higher percentage in the upper part of the class. In college Y no students admitted free of conditions were dropt. Clearly the examination system works well in these two colleges.

The number of cases reported from Johns Hopkins was relatively small and unfortunately those admitted by a combination of certificate and examination were included with those admitted by examination only. Moreover the data were not uniform with the others in other particulars and were consequently unavailable for purposes of comparison.

The data afterwards obtained from Mount Holyoke (three classes) and Smith, Vassar, and Wellesley (one class each), are of the greatest interest and constitute much the most valuable part of the committee's report. They contain information relative to students admitted by examination only, by certificate only and by a combination of the two methods—students who have certificates in some subjects, but not in all. These last are in general inferior to either of the other two groups.

The results are shown in the following tables. It was not possible to get complete separate data for the conditioned sub-groups; the tables give the results for the groups as a whole and for those admitted without conditions.

TABLE A

PERCENTAGE DROPT FOR POOR SCHOLARSHIP IN FIRST TWO YEARS

All Students

College	*Admitted by Examination*	*Admitted by Certificate*	*Admitted by a combination of Examination and Certificate*
A	3.32	[3]6.33	[3]10.78
B	2.9	11.13	10.52
C	9.1	[3]11.63	17.64
D	0	6.33	14.93
Total	*3.15*	*9.46*	*13.62*

Students admitted without conditions

College	*Admitted by Examination*	*Admitted by Certificate*	*Admitted by a combination of Examination and Certificate*
A	0	6.33	10.78
B	0	6.23	12.57
C	0	11.63	13.88
D	0	4.38	10.6
Total	*0*	*7.05*	*11.73*

Those admitted by examination only make the best showing, even when the whole group is compared with those admitted without conditions by the other methods. This is true with one exception of the individual colleges as well as of the total.

TABLE B

Percentage Graduating

College	*Admitted by Examination*	*Admitted by Certificate*	*Admitted by a combination of Examination and Certificate*
A	76.12	65.11	
B	85.29	73.44	69.47
C	63.63	64.85	61.76
D	84.21	73.15	70.11
Total	*78.93*	*68.19*	*66.35*

[3] No students admitted with conditions in these groups.

The group admitted by examination is decidedly superior to the others except in college B where they fall slightly below the group admitted by certificate. In other words, failure to graduate, from whatever cause, is less frequent in the examined group.

In every case the percentage graduating in the highest third of the class is greater from the group admitted by examination than that from either of the other groups; in every case but one the percentage for the first group is also higher in the middle third than for either of the other groups. Without exception the percentage of this group graduating in the lowest third of the class is distinctly lower than for either of the other groups. The same results appear more strikingly when we consider only those admitted without conditions. Except in college B, none of the students admitted by examination without conditions graduates as low as the lowest third of the class.

It will be noted that the records of students admitted by examination are distinctly better than those of students admitted by the other methods. In these colleges as in college Y above no students admitted by examinations without conditions were dropt for poor scholarship. Including those admitted with conditions, their record is better than that of either of the other groups admitted without conditions.

They furnish a higher percentage of graduates and a higher percentage of those graduating in the upper part of the class. What is true of each is true of each of the two classes in Mount Holyoke and it is true also for all the colleges taken together. The number of those admitted by examination alone in these four colleges was unfortunately small, only 95 to 940 admitted by certificate and 498 by a combination of the two.

But what is true of the whole ninety-five is true of each of the sub-groups. The percentage of failure in each is smaller than for those admitted by the other methods—whether with or without conditions: the percentage of graduation is higher; the percentage graduating in the highest third of

TABLE C

Percentage of Each Group Graduating in the First, Second, and Lowest Thirds of the Class Respectively

	Admitted by Examination			*Admitted by Certificate*			*Admitted by a Combination*		
College	*First third*	*Second third*	*Lowest third*	*First third*	*Second third*	*Lowest third*	*First third*	*Second third*	*Lowest third*
A	39.13	34.18	26.08	37.8	37.8	24.3			
B	37.93	44.82	17.24	33.19	31.5	35.2	31.8	34.8	33.3
C	42.85	42.85	14.28	35.7	34.0	30.1	27.3	32.1	40.4
D	56.25	43.75	0	35.45	37.27	27.27	31.1	22.9	45.9
Total	*42.66*	*41.35*	*16*	*35.09*	*34.32*	*30.57*	*29.85*	*30.33*	*39.81*

ADMITTED WITHOUT CONDITIONS

Percentage of Each Group Graduating in the First, Second, and Lowest Thirds of the Class Respectively

	Admitted by Examination			*Admitted by Certificate*			*Admitted by a Combination*		
College	*First third*	*Second third*	*Lowest third*	*First third*	*Second third*	*Lowest third*	*First third*	*Second third*	*Lowest third*
A	62.5	37.5	0	37.8	37.8	24.3			
B	33.3	50	16.6	33.8	33.4	30.7	31.8	34.8	33.3
C	60	40	0	35.7	34.0	30.1	27.3	32.1	40.4
D	70	30	0	36.5	35.5	27.8	31.1	22.9	45.9
Total	*51.23*	*41.46*	*7.31*	*35.6*	*35.4*	*28.8*	*33.3*	*30.0*	*36.58*

the class is invariably higher; the percentage graduating in the lowest third is invariably lower. We have not simply ninety-five cases in four colleges satisfying the test from five different angles—loss from the whole group—loss from the unconditioned group, percentage graduating, distribution at graduation for whole group and for unconditioned group; we have not only this, we have also the five tests applied to the sub-groups from each of the four colleges and we have agreement as far as comparison is possible with the 547 in the examining colleges. This may not be demonstration but it does greatly strengthen the presumption that good examinations well administered supply the best method of selection among candidates for admission to college. If any college has found in its own experience that examinations have not served as a good method of selection let it look to its examinations.

Clearly additional information regarding the candidate's records and personality should be obtained and used as fully as possible. Fortunately, the value of such information is now clearly recognized. The Columbia Admission system adopted in 1909 and the new Harvard system first employed in 1911, and since adopted by many other leading institutions, make the school and character record an essential part of the candidate's application for admission.

ADAM LEROY JONES

COLUMBIA UNIVERSITY

IV

DISCIPLINARY VALUES

During the past decade there has been a very rapid change in American education. Many careful thinkers are of the opinion that much of this change has been unwise and that there will shortly be a reaction against most of the recent innovations. In fact, there are not a few visible signs that such a reaction is already commencing. But there exists on the other hand a group of educational theorists who contend that the change has been very meager compared to what it should have been. They are not satisfied with the process of evolution carried on at a twentieth century pace, but they wish to substitute for it the process of revolution. These gentlemen refer to themselves as "modernists" with an obvious degree of self-satisfaction. They perhaps forget that the men who created the Reign of Terror during the French Revolution could have styled themselves modernists in much the same sense. They, too, wished to destroy all existing institutions in order that they might refashion them according to their own ideas. The only thing lacking in our educational modernists of today to complete the analogy is that they have not as yet suggested that all teachers in the present system should be guillotined in order to clear the way more rapidly for the new order of things.

The modernists are quite convinced that all the methods of instruction that have been developed by years of patient labor are worthless, that all the ideals that have stood the test of centuries are delusions. How could the workers of the past have produced anything of value since true wisdom in educational matters did not exist until now? Any educational method or doctrine that has a long and honorable history is for that very reason to be condemned; if it has still many defenders they must perforce be slaves to tradition.

There is in particular one educational doctrine of long

standing and wide repute which is anathema to the modernists. This is the doctrine which asserts that the study of a particular branch of knowledge results in a certain amount of general training and thus gives increased power in many other fields of intellectual endeavor. This doctrine has received various designations such as, the doctrine of formal discipline, the doctrine of general training, the theory of mental discipline. Under each of these headings it has been vigorously assailed by the group of theorists who wish to revolutionize our educational system.

The purpose of the present paper is to justify this doctrine, in other words to show that disciplinary values form a very important part of the benefits derived from education. This will be done in two ways, first by pointing out the weakness of the arguments directed against this position, second by presenting some of the important evidence in favor of it.

Most of the writers who attack the theory of mental discipline deal to some extent with the psychological phase of the subject. Some of them content themselves with brief statements of a rather general character designed to give the impression that psychologists do not believe in mental discipline and that their experiments justify this attitude. As we naturally wish to credit these writers with being convinced of the accuracy of their statements, we can only conclude that their reading on the psychology of mental discipline has been rather limited in scope, and that instead of advising their opponents to study more closely the works of psychologists they might well devote their energy to following this advice themselves.

Other writers who have apparently read more widely in the psychological field are aware of the futility of attempting to dismiss this phase of the subject with a few statements that are obviously contrary to fact. Not having the advantage of a blissful ignorance that can complacently deny known facts, they are forced to resort to a sophistry that endeavors to pervert their significance. The mutually contradictory statements which this endeavor usually calls

forth are well illustrated in a recent paper in Education, written by one of the prominent opponents of our thesis.

At the beginning of the paper the author quotes from Whipple the following statement: "The problem of mental discipline, of determining under what conditions, by what methods and to what extent training received in a given line of mental activity spreads to other lines of mental activity is acknowledged to be the central problem of educational psychology." He then goes on to assert that "it is the central problem of educational philosophy as well, and the attitude which we who teach take upon this problem determines as nothing else does what we put into courses of study and how we teach that which we attempt to teach." Just four pages later he makes the following statement: "The question which is being investigated is to what extent that which is learned in one context is and can be applied in another context. In many respects this is purely a psychological question and of no great interest to educational practitioners." Did the writer hope that the somewhat modified form of phraseology of the second statement would conceal the fact that it baldly contradicts his first statement, or is his burning zeal to attack the doctrine of general discipline so all-compelling that he automatically changes his opinions whenever this is necessary for the formulation of a new attack?

One might hope that having completely reversed his attitude once in the course of four pages, the writer would remain consistent thereafter as to the significance of experiments on the transfer of training. But this is apparently too much to expect from one who feels a missionary's responsibility to attack the doctrine of general discipline. At the end of five more pages he comes back to his original opinion and proceeds to justify his whole standpoint on the basis of the experimental work of a single psychologist. The reason for this second reversal is amusingly apparent. At the time he first changed his opinion he was attempting to depreciate the work of the many experimental psychologists who have drawn conclusions highly favorable to the doctrine of general discipline. A little later, having found one

psychologist whose conclusions agree with his own fixt opinions, his estimate of the value of psychological experiments for the determination of educational practise fluctuates back to its original level. How seriously are we to take a writer who completely changes his opinion on the same subject twice in the course of nine pages?

In many discussions of the question at issue we find a disposition to blame all the ills that education is heir to on the theory of mental discipline. Thus in a recent paper in the *Atlantic Monthly*, written by a prominent figure in the educational world, we find reiterated in various forms the statement that educational practise in the schools has been up to this time dominated by the theory of mental discipline. This is not the case, for some of the sensational but ill-founded attacks that have been made on this theory have been widely exploited and have been accorded by many educational administrators a far more serious consideration than they deserved. This has had a very pronounced effect, mostly deleterious, on educational practise, and any one who has read much of recent literature on educational subjects ought to be aware of this fact. The following quotation from Bagley's *Educational values* is typical of the statements made by many educational writers: "The prevailing tendencies in American schools are almost exclusively in the direction of recognizing no materials of education that can not be justified on their intrinsic instructional or training merits, and without reference to their virtues in developing generalized habits, tendencies, or attitudes that are supposed to influence conduct in unrelated fields."

Practically all the writers who attempt to depreciate the importance of disciplinary values misrepresent the attitude of their opponents. For instance, in the paper referred to in the previous paragraph we find the following statement: "Nor is the study illuminated by being brought to bear. . . . The disciplinary purpose narrows and impoverishes." As a matter of fact the advocates of disciplinary values realize that the transfer of training which may take place without external assistance in the case of the brighter stu-

dents, must be facilitated by the teacher in the case of those less gifted. For this reason they urge the application of a general method to a variety of situations in order to make plain to the student the possibilities of such applications. Thus the disciplinary purpose broadens and enriches; it does not narrow and impoverish. If those writers who are so obsessed with the idea that the conception of mental discipline contributes nothing beneficial to educational theory and practise would only study carefully such constructive discussions of this topic as are to be found in Colvin's *Learning process* and Judd's *Psychology of high school subjects*, perhaps a new light would dawn upon them.

There are many other statements in the writings of our opponents which can be challenged on account of their lack of accuracy or logical consistency. But it would seem that we have already pointed out enough weaknesses of each type to show the reader how insufficient are the arguments usually brought forth in an endeavor to show that disciplinary values are negligible. The writers who advance these arguments are laboring under the handicap of trying to prove something that is not true. It is therefore quite natural that their discussions will not stand the light of criticism.

The fact that the ablest writers who attempt to discredit the theory of mental discipline only succeed in involving themselves in misstatements and logical inconsistencies, is strong proof of the impregnability of the position they are attacking. But such proof, however strong, is only negative, and it is therefore desirable to consider some of the positive proof of the importance of disciplinary values.

We will consider first the evidence for our case that is to be found in the results of psychological experiments and the conclusions of psychologists based on such results. The fact that the writings of psychologists furnish sound basis for arguments in favor of disciplinary values may surprize many readers, so persistent and so vociferous have been the attempts to persuade the reading public to the contrary view. For this very reason it is highly desirable that some of the

facts known to those who have made a close study of the psychological literature on this topic should be frequently brought out in discussions of a more general nature.

Without entering into technical details that would be out of place here, it may be stated that the psychological experiments in question made use of the following general method: First one or more groups of individuals were tested as to ability in a certain field of mental activity, such as memorizing verses or estimating lengths. Then some or all of the groups were given a certain amount of training in some other field. After the training they were tested again as to their ability in the first field. From a comparison of ability before and after the training, or from a comparison of the change in ability of the trained groups with the change of the untrained groups, certain conclusions with regard to the transfer of training were drawn.

With regard to the results of these experiments, it is important to point out that most of the experiments showed a considerable amount of transfer of training, or to phrase it otherwise, the training received was to a considerable extent general training, at least so far as the two fields of mental activity under consideration were concerned. In this connection it may be well to quote briefly from a recent monograph by Dr. J. E. Coover, entitled *Formal discipline from the standpoint of experimental psychology*. In this monograph Dr. Coover reviews the previous experiments in this field and also an extensive series of experiments of his own. In the course of summing up the results he makes the following statement: "Specially designed experiments show that 'specific' practise is never wholly 'general' in its effects; it is often largely 'general', and is probably always somewhat 'general'. Under the experimental conditions, the 'general' effect usually ranged in amount from one-fourth to three-fourths of the gain made in the specific practise."

With regard to the conclusions of psychologists on the basis of their experimental results it may be stated that a striking majority of these conclusions are favorable to the position adopted in this paper. This in itself furnishes

strong evidence of the correctness of that position. The evidence along this line is strengthened by the fact that of the two prominent experimental psychologists who have attacked our position, the conclusions of one have already been discredited by a number of writers on the basis of his own experimental results, and the conclusions of the other are quite open to attack on similar grounds.

The two psychologists in question are Professor E. L. Thorndike and Dr. W. G. Sleight. Professor Thorndike's experiments, carried thru in collaboration with Dr. Woodworth, were among the earlier ones in this field; naturally, they were crude, faulty in technique and limited in scope. The conclusions drawn by the investigators and later much exploited in the educational writings of Professor Thorndike and others were very sweeping in their nature. It seems impossible to discover any scientific justification for drawing conclusions of such wide generality on the basis of such essentially limited and imperfect experimentation. It is therefore not surprizing that these conclusions have since been discredited. It is also not surprizing that Professor Thorndike himself has considerably modified his own attitude in the matter, as is strikingly shown by Professsor Judd in his *Psychology of high school subjects* by means of the juxtaposition of two quotations from Professor Thorndike's own writings.

This leaves only the opinion of Dr. Sleight to comfort the advocates of the doctrine that training is merely specific. Some of them are grasping at this opinion as a drowning man clutches at a straw, as is illustrated in the paper in Education we have discust previously, where the author, after trying to discredit the evidence from experimental psychology in one part of the paper, does not hesitate later on to base his whole argument on the conclusions of Dr. Sleight. He takes pains to mention the fact that Dr. Sleight has criticized earlier experiments in this field, but he fails to note that Dr. Sleight's experiments have been very effectively criticized in turn in the more recent discussion of Dr. Coover. In fact, as the latter has pointed out, the experiments of

Dr. Sleight possess some of the same defects that he himself had objected to in the work of others.

The most fundamental weakness in Dr. Sleight's argument may be clearly indicated without going into technical details. He was engaged in experiments on the effect of training the memory, and these experiments were all made on groups of individuals engaged at the time in school work. The experiments occupied approximately from two to three hours time per week for each individual concerned, and during the rest of the time spent in school these same individuals were obviously engaged in tasks that involved considerable memory work, and which must have had at least as much effect on the memorizing ability of the students as the exercises involved in Dr. Sleight's experiments. Yet he completely ignores this effect, and tacitly assumes that the entire change in memorizing ability was due to the tests and training to which he subjected the students during the relatively brief time they were under his supervision. This one factor alone invalidates Dr. Sleight's argument, for by taking account of the effect he has neglected, and making a few assumptions with regard to it that are at least as reasonable as those made in his discussion, we arrive at a result that flatly contradicts his conclusion.

We have considered briefly the general psychological evidence in favor of our position. We turn now to the particular evidence that depends upon the nature of particular subjects of instruction. In this connection each school subject requires separate consideration. As it would be manifestly impossible to consider very many different subjects in the course of a brief discussion, we will select a single subject, mathematics, to illustrate the method of procedure. This particular selection is made, partly because of the writer's greater familiarity with that field, and partly because of the fact that mathematics has very important disciplinary values.

One of the most useful contributions of mathematics to the education of a student is in the way of increasing his reasoning powers. This is a virtue which is almost uni-

versally ascribed to mathematics but which is denied by those who do not wish to admit the importance of disciplinary values. Let us examine then some of the positive evidence that justifies the widespread belief that the study of mathematics improves the power of logical analysis.

Treatises on logic divide reasoning into two general classes, inductive and deductive. Of these two types of reasoning the deductive type is the more frequently used and the more important for most people. Laws of wide generality are not found every day, and it is not the purpose in life of most people to look for them. On the other hand, we are continually called on to infer particular consequences of certain principles that are well known, in other words, to make deductions. Moreover, even for those who are engaged in making inductions, deduction is of the highest importance. A new induction is always more or less to be suspected, and it should always be tested by seeing if the deductions from it accord with known facts. Three of Newton's contemporaries, Wren, Halley, and Hooke, had surmised as well as he the existence of the law of gravitation. But to Newton alone is properly given the honor of its discovery, for he alone deduced from it Kepler's laws of planetary motion and thus verified his induction.

The importance of deductive reasoning and the desirability of every one being well trained in it is therefore evident. If mathematics furnishes a thoro training in such reasoning it certainly contributes much to the development of reasoning power. It only remains then to present evidence that it does furnish such training.

Any process of deductive reasoning can be analyzed into a series of syllogisms; there are only a limited number of valid forms for a syllogism, so after one has used all of these time and again in his deductive reasoning in one field, he will have been trained in the essential process of reasoning in any field. Deductive reasoning is so constantly used in mathematics that any student who spends several years in a proper study of this subject is certain to become familiar with all the valid forms of reasoning and to be put on his

guard against invalid arguments. In this particular respect mathematics is superior to any of the other school subjects because in no other subject is deductive reasoning so frequently used, nor in so pure a form, and in no other subject is it possible to test the validity of one's results to the extent that this can be done in mathematics. That the process of deductive reasoning can be adequately learned from the study of mathematics is therefore evident. This does not mean, of course, that the student who has been trained in mathematics can immediately reason in any other field; he must first become familiar with the data on which he is to reason. I think this fact is at the bottom of the contention that is sometimes made that people who reason well in some lines do not reason well in others. No matter how great one's powers of reasoning, he is not able to use them on data with which he is unfamiliar or only vaguely familiar. It is quite apparent that the greatest mathematician in the world could not reason about Chinese grammar if he were totally unacquainted with the Chinese language. However, what is apparent in this extreme case is sometimes falsely interpreted in cases that are less extreme.

In addition to learning the detailed process of valid reasoning, the student of mathematics gains much insight into the general method of the logical organization of knowledge. By the logical organization of knowledge we mean the process of arranging the known facts in a certain field in a logical sequence based on a few fundamental principles. That such a logical organization corresponds to a real need of the human mind and makes for an economy of mental effort in the comprehension of knowledge would appear to follow from the fact that in all fields of knowledge the tendency is toward such an arrangement. Thus in the physical sciences certain general hypotheses with regard to the nature of matter, the nature of electricity and so on, are made in order that the vast number of known phenomena may be organized into a logical system based on the hypotheses in question. Such hypotheses are frequently modified, or completely abandoned and replaced by new ones when new

phenomena are observed which can not be explained in terms of them. This shows that the hypotheses have no virtue in themselves; the sole reason for their existence is the fact that they facilitate the logical organization of knowledge.

That mathematics furnishes an admirable training in such logical organization is indisputable. It has been developed on the basis of fundamental hypotheses that have never been invalidated by any human experience, and therefore has reached a more perfect form of logical organization than any other subject. Hence all those who have studied mathematics have an excellent model to assist them in the logical organization of their knowledge in other fields, and there are many examples to show that they frequently make good use of it. It is not a mere accident that France selected one of her ablest mathematicians, Paul Painlevé, as minister of war at the moment the great European struggle approached its most critical stage. She had noted his organizing ability in other fields of public service and she assigned him to a post where a high degree of such ability was of vital necessity.

Training in deductive reasoning and development of the power of logical organization are not the only contributions of mathematics to the education of those who study it. They are not even the only contributions that can be classified among the disciplinary values of mathematics. They are, however, among the most important ones that can be so classified, and space is lacking to consider all the others. But these alone are so extremely useful in all forms of intellectual labor as to render absurd the contentions of those educational theorists who deny the importance of disciplinary values.

CHARLES N. MOORE

UNIVERSITY OF CINCINNATI

V

THE HIGH SCHOOL BOY AND MODERN SOCIAL PROBLEMS

A high school boy of nineteen, in his senior year, was asked to name in order of their seriousness all of the social evils about which he had any information. He named the following in the order given—dancing, moving pictures, joy riding, roller skating and parks. Another high school boy, a junior of eighteen, in answer to the same question named the following evils in the order given—pool rooms, hanging around corners, bad company.

With the knowledge of present social conditions indicated by these replies, these two boys were soon to choose vocations in which they would be called upon to deal with the social and economic problems of the day. Within three years they were to become voters. Born into a social order more intricate than any other in history, with the many manifestations of disease, crime, poverty, and war threatening the very survival of the nation, these two boys see in pool rooms, and dancing, the most serious social evils of the day. And society expects them to go out into the world as citizens and act intelligently.

These boys are not isolated cases. The same question, together with others, was presented during the school year 1915–1916 to junior and senior high school boys in nine representative cities of the United States. Virtually all the question blanks sent out were used, and 827 replies were received. The answers bear evidence of having been prepared in a spirit of earnest interest. Five blanks out of the entire number may be said to have been filled out in a spirit of fun. These, of course, have been rejected. It is believed that the selection of cities, the number of replies received, and the other conditions of the inquiry justify generalizations and that the replies of these boys reveal in large mea-

sure, first, the knowledge of American upper class high school boys regarding the facts of our present economic and social life, and, second, their attitude towards society.

I

Let us first see what junior and senior high school boys know about the larger social evils of the day.

1. The question referred to above was formulated as follows:

Name in order of their seriousness all the social evils (anything which causes human suffering) about which you have any information (*i.e.*, place the most serious first, the next most serious second, and so on).

There were 777 boys who replied to this question. The following table gives the distribution of all replies. The opinions of individuals regarding the relative seriousness of the evils which each of them named have had to be ignored in this tabulation.

Social Evils	*Times Mentioned*
1. The saloon and the liquor business	633
2. Questionable social customs and personal habits (stated or implied), such as smoking, dance halls, late hours, loafing, neglect of lessons, foolish dress, and such	610
3. Prostitution and various sex evils	456
[1] 4. Bad industrial conditions (stated or implied), such as capital and labor, labor problems, injustice, large fortunes, low wages, high cost of living, unemployment, women in industry, child labor, monopolies, socialism, and social classification	349
5. Qualities of character (stated or implied), such as greed, prejudice, ignorance, town knockers, lack of religion	307
6. Various aspects of poverty	171
7. Disease and accident	162
8. Various aspects of crime	147
9. Evils of home life, such as congestion, divorce, birth control, lack of birth control	134

[1] The criticism may be made that groups 4 and 6 should have been combined. They are reported separately to emphasize the distinction between the replies which disclose only vague ideas of industrial unrest and the replies which reveal a recognition of the misery resulting from social maladjustments.

10. Dishonesty in business and public life	116
11. War and militarism	78
12. Racial evils	19
13. Insanity and feeblemindedness	16

The table above may be readily interpreted. These boys stress the importance of personal evils because they have only casual opportunities for learning about social evils. High school students, as a group, live in a circumscribed world of petty concerns and pleasures. They observe the evil effects of smoking and loafing, they see drunkenness on the street, they learn from their fellows more about prostitution and other sex evils than most of their elders believe. They acquire from newspapers vague ideas about an industrial unrest which they express by such terms as capital and labor, socialism, low wages, and large fortunes; but they have no regularly appointed opportunities for learning the important facts in regard to poverty, crime, disease, and war.

A distribution of the evils named first by each boy, and therefore considered most serious, shows similar results. The tabulation is omitted for lack of space.

2. The ignorance of high school boys, as a group, regarding social and economic problems is shown also by their answers to the following question:

> By studying sociology and economics, men may learn how to check poverty and crime. Has this idea ever come definitely to your attention before?

Of 758 who replied, 38 per cent said, no.

Over one-third of the group, then, were about to leave high school, either to enter college or to go to work, without knowing even what the words economics, and sociology, mean. Many boys continue in college the subjects in which they become especially interested while in high school. Unless they are advised while in college to look into the field of social science, they will probably graduate from college without a well-balanced knowledge of modern social conditions. What is of more importance, perhaps, a large proportion of high school graduates never enter college. They

go into political and business life inadequately prepared to meet its serious social problems.

3. By their answers to another question, many boys showed how utterly they failed to comprehend the significance of history and the present standing of the United States as a nation. The question follows:

How long do you think the United States of America will survive as a great nation?

Of 797 who replied, 41 per cent thought the nation would endure forever, or indefinitely. An additional number mentioned long periods of years. The mere possibility of this nation's succumbing to the fate of Greece and Rome seems never to have entered the minds of the majority.

The reply, forever, by grammar school boys might be considered merely naïve. But such a reply from older high school boys shows a disregard of the serious dangers within the nation that can hardly be past off lightly as childish patriotism.

4. Presumably, if boys are to succeed in their vocations and if they are to become useful citizens, they should be familiar with men who have been successful in the vocations of their choice, and with men who have rendered large service to the nation. It is important, therefore, to know how well informed boys are, first, regarding successful men in the vocations they are choosing and, second, regarding useful men in general.

The replies to the next two questions will throw some light on these points. The first deals with the idea of success. It was formulated as follows:

Name two men who you think have been most successful in the vocation which you have chosen or which you will probably choose.

Of 760 who answered this question, twenty-five per cent seemed unable to give any examples at all and sixteen per cent gave only one example. A total of 1,016 examples were given. Of these, sixty-one per cent were examples of obscure men. The prominent men named were largely those con-

spicuous in newspapers. Goethals was mentioned most often as an engineer, Ford most often as a business man, and Edison most often as a scientist. In the field of education, Woodrow Wilson, of course, was well known because of his present political prominence. Charles W. Eliot and David Starr Jordan were each mentioned once. The Mayo Brothers in the field of medicine, were named eleven times, but not one boy seemed to know of Walter Reed who risked his life in the fight against yellow fever and who, in the opinion of some authorities, made the greatest contribution in the field of preventive medicine that has ever been made in America. Such ignorance, of course, is not due to any failure on the part of the boy, but to a deficiency in the school.

5. The other question deals with the idea of usefulness. It follows:

> Name two particular vocations in which a man may be most useful as a citizen and name two men who have been successful in these vocations. In what respect do you think these vocations are useful?

In attempting to name successful men in vocations considered useful, in most cases either obscure men were given or there were no examples mentioned at all. This fact may not be especially significant. But it is significant that forty per cent of the replies indicate that the writers had no adequate conception, or only a vague conception, of usefulness.

One boy thought that the law was a useful vocation, because "a lawyer may help by constant contact with the people." Another boy thought that invention was a useful field because it "broadens a person's mind." Still another considered law a useful vocation because it "causes a person to be an independent thinker." Tho the question deals, of course, with the usefulness to society of various vocations, these boys evidently had in mind the usefulness of vocations to the individual youth.

One hundred and one boys (nine per cent) seemed to have missed completely the idea of usefulness. One boy thought

the grocery business was a useful vocation because "the grocer discusses political problems with customers." He also thought the ministry was a useful vocation because "the preacher also discusses political affairs." Another boy said mining was a useful occupation because "in mining you get rich quick and it is interesting."

II

Let us now see what we can learn regarding the attitude of high school boys towards society. Are they planning to be constructive agencies in the social order, or are they indifferent to the well being of their fellow men? Are they ambitious to get out of the world all the wealth and pleasure they can, or to contribute to the wealth of the world and the happiness of society?

1. After a question regarding their choice of a vocation, they were asked to answer the following:

Which of the following phrases would most accurately express your real aim or aims in choosing this vocation? Indicate by check mark.

"———— 1. To make a comfortable living.
———— 2. To get rich.
———— 3. To win prominence or fame.
———— 4. To win political power.
———— 5. To get into an interesting occupation.
———— 6. To get something that is easy.
———— 7. To be happy.
———— 8. To better the living conditions of others.
———— 9. To prevent or check disease, crime or poverty.
————10. To do good in the world."

Replies numbering 543 were received from five cities to the question as it appears above. Of the 543, seventy-five per cent indicated two or more aims; forty-one per cent indicated four or more aims; and thirteen per cent indicated six, seven or eight aims. An effort was then made, by changing the form of the question, to induce the boys from the other four cities to select a single phrase which would

most accurately express their vocational aims. Of 279 from these four cities who answered the question, forty-one per cent indicated more than one aim.

If the answers are evaluated on a basis of social interests, the results are virtually the same whether we consider the boys who named several aims or those who named only one aim. This is shown by the following tables:

Distribution of 2160 choices made by 823 boys		*Distribution of choices of 291 boys, indicating only one aim each*	
Individualistic aims (indicated by phrases 1 to 7)	64%	Individualistic aims (indicated by phrases 1 to 7)	68%
Social aims (indicated by phrases 8 to 10)	36%	Social aims (indicated by phrases 8 to 10)	32%

As far as older high school boys are able to interpret their life purposes, then, most of them have aims which are primarily individualistic. To many, this fact may not be surprizing, for boys should want to make a comfortable living and enter into interesting occupations, as well as aspire to serve their fellow men. The next question dealing with their reasons for wanting to attend college is, perhaps, a better test of their attitude towards society. We are accustomed to look for a higher degree of social purpose in boys when they are planning to enter college.

2. The question follows:

Do you intend to get a general college education? (Of 725 who replied, sixty per cent said, yes.)

If so, please state DEFINITELY why you want a general college education.

The answers show that the purpose of high school boys in seeking a college education is also individualistic. One boy replied, "So I may take care of myself in later years;" another answered, "A general college education gives you polish and enables you to carry on a conversation with educated people." Other replies follow: "For my own welfare," "The business world looks upon the college man as a very polished and efficient man," "Because I wish to know of other things be-

sides work. To increase my line of subjects about which to converse outside of work," "Because ignorance is costly to yourself and others, and the man that knows how is the one who succeeds," "So I may get a better job." Of the 416 who replied, only nine per cent indicated social aims.

3. Another question, the replies to which throw light upon the high school boy's attitude towards life, was formulated as follows:

> In your opinion, what must a man ACCOMPLISH, in order to be considered successful in the vocation which you have chosen or which you will probably choose?

Of 782 who replied to this question, eighteen per cent indicated that, in their opinion, a man must in some way contribute to the welfare of society in order to be considered successful; twenty-one per cent named some selfish end in life which they thought a man must accomplish in order to be considered successful. It is perhaps more significant that sixty-one per cent showed a confusion of ideas. They failed to distinguish the idea of a means to an end from the idea of the end to be accomplished. A few replies were as follows: "Must become well known for honesty and reliability," "Study and work hard," "Must have a reputation for speed and accuracy."

Boys should be encouraged, of course, to realize the value of industry, honesty, and other virtues. They should be encouraged to be self-supporting and to make a comfortable living for their families. Our study, however, shows that the thinking processes of most of them stop at that point. The idea of ultimate ends in life seems not to be a subject of much discussion or thought.

4. The replies to one other question will be mentioned in conclusion. It was worded as follows:

> Would you like to take up a scientific study (thru sociology and similar subjects) of the causes of human suffering as a part of your high school work? If so, why would you like to?

Of 791 who replied, the majority (sixty per cent) said, yes. Following are a few of their answers:

Yes, because it would enable you to check the causes and better the world, if you ever had the opportunity to do so.

Yes, so in case of emergency one might help others, as well as himself.

Yes, so that I can be of some good in helping human suffering.

Some readers may be surprized at the ignorance and complacency of older high school boys which the study discloses. When one considers how little opportunity there now is for high school boys to become acquainted with present-day social evils; to learn of the men who are combating them and who in other ways are definitely contributing to the welfare of society; and to gain a simple philosophy of life which will enable them to think clearly upon life purposes, one can hardly expect different results.[2] In civics, they learn about the machinery of government, but there are no regular opportunities for them to study the problems for the solution of which the machinery exists. Boys should not be condemned for this ignorance and complacency.

Tho these boys had but little information upon which to base an opinion of the value of sociology as a high school subject, a majority of them answered, yes, when they were asked if they would like to study the causes of human suffering as a part of their high school work. A study of the many and varied replies given to the first question mentioned in this paper shows how wide is the range of intelligence in adolescence, and how well developed is the capacity for comprehension when there is opportunity for learning the facts. Those who have taught courses in social problems testify that the adolescent mind is capable of a high degree of intellectual grasp and sympathy in dealing with the subject.

During the adolescent period, the important years of which are spent in the upper high school grades, the boy normally turns his attention away from self and centers it upon larger interests. He becomes a member of a group. Formerly he played with his companions as an individual,

[2] See **The Youth and the Nation,** Harry H. Moore, The Macmillan Co., New York, 1917.

now he becomes a member of a team. At this period, he has not become hardened by failure and by disappointed hopes; he has not become blasé. He develops a vigorous imagination; the idea of risk and adventure appeals to him; he plans a career of high achievement. It is in adolescence that many a boy is ready to give himself to a noble cause, to serve mankind, to sacrifice life itself for the sake of others. But social interest must have an objective. It seems reasonable to suppose that one of the reasons why older high school boys are individualistic and complacent is that they are ignorant of social evils and of the warfare being waged against them.

The high school youth of today is living in one of the most critical periods in history. If the civilized nations of the world are to overcome the social evils which menace them, they must understand society as it is now organized. Never before has there been a greater need for men who will give up selfish pursuits and direct their attention to the welfare of the group. A noble army of men and women in many walks of life is now combating the evils which threaten us. The colleges are recruiting and training an increasing number. But many high school boys are unable to attend college, and the interests of those who do are crystallized, in large measure, before they enter. If the warfare against poverty, crime, and disease is to be won, a larger force must be recruited. Our destiny rests with the young people in the high schools, and with those who will be in the high schools during the next two or three decades. They must be enlisted.

HARRY H. MOORE

REED COLLEGE
PORTLAND, OREGON

VI

GEOMETRY IN THE ELEMENTARY SCHOOL

Before proceeding to consider how the teaching of geometry may be improved, it is necessary to come to some understanding as to why geometry should be taught at all. There are, of course, certain obvious reasons which are usually advanced in its support, such as its practical utility, its value as general information, or the mental training it gives in logical reasoning. These claims, however, are not peculiar to geometry but are common to many subjects of instruction. The real reason for the educational value of geometry is apparent when we consider the nature of the subject matter. Disregarding for the moment any particular form in which the subject may be presented, geometry as a science rests on universal agreement as to certain facts of experience and intuition, which gives it a basis of certainty and conviction not shared by any other subject of elementary instruction. The mental attitude which this implies is the vital feature which distinguishes geometry from experimental sciences like chemistry and physics, as well as from an empirical study like language, or from one accepted on authority like geography or history. Every one must admit that the growing mind needs to dwell on some form of absolute truth in order to develop a balanced judgment which shall be able to discriminate between the arbitrary and conflicting claims and assertions which are met in life, and it must also be admitted that no form of truth is more clear cut and distinctive than the logic of geometry.

Upon this foundation of absolute certainty geometry erects an unassailable structure of pure thought, limited by no imperfections of measurement or other human inaccuracies. Moreover, if taught as here intended, it is not presented all at once as a completed system, but is evolved gradually by each individual, thereby making the process of

thought an integral part of his mental equipment. The practical utility of geometry is then merely a by-product, altho of sufficient value in itself to pay for all the labor involved in its mastery.

In this connection, note the distinction between practical utility and educational utility. Practical utility is measured by commercial standards and therefore in terms of the adult world of reality. Educational utility is measured by the vividness with which a principle is imprest on the mind of the pupil. In view of this distinction, applications of mathematics which have no commercial value may nevertheless be of the highest pedagogical utility. To be efficient and scientific therefore, the teaching of geometry must satisfy two requirements:

1. It must determine what constitutes the world of reality for the particular pupils concerned.

2. Utility must be determined by the reality of the impression conveyed. In general it may be said that educational utility resides in any course of instruction which serves to coordinate mental images, develops the reasoning ability, and adds materially to the power of self-expression. As the study of geometry is peculiarly adapted to serve these ends, it seems to be sufficiently evident that it should occupy a larger place in the curriculum than that allotted to it at present.

To plan intelligently an elementary course in geometry, it is essential to recognize the successive stages in the unfolding of the geometric concept. As our schools are now organized, these are three in number. The object of the first, or primary, stage is to familiarize the child with simple geometric ideas by object teaching, paper folding, and similar methods, in order to amplify his ordinary space concepts. The aim of the second, or grammar, stage should be to stimulate the imagination and develop the power of reasoning without any formal presentation of the subject as geometry. With a child, abstraction of ideas must proceed gradually, and new material must be related at each step to that already forming part of the child's experience. This means, at this stage of instruction, that the subject

matter must be concrete and familiar, for the simple reason that the child must perceive geometric relations between familiar things before he can be expected to abstract these relations. The aim of the teacher should be to formulate problems so as to present certain geometric relations in as many and varied forms as come within the limits of the child's experience, in order that the ideas themselves may finally take shape as a general relation, or principle independent of the objects related.

As the work proceeds the problems should be so formulated as to lead to the idea of locus and function. It has been found that it is impossible to impart these ideas except by relating them to individual experience. It is also now well recognized that the function concept is the basis of modern scientific thought, and should be the central feature of mathematical instruction. It is important, therefore, to so plan our geometric teaching that the ideas of locus and function develop gradually and naturally, by marking points which satisfy certain sets of relations until a sufficient number have been located to exhibit a definite arrangement. To do this systematically is to bridge the gap between the discrete and continuous, which is the main difficulty encountered in passing from arithmetic to algebra, and also to unfold gradually the function concept and thereby furnish the pupil with the key to modern scientific thought.

The history of elementary mathematics indicates that the idea of form is as primitive as the idea of number. Observation has also shown that a child appreciates form quite as well as number, if not better. Moreover, the history of mathematical development shows clearly that it is merely accidental that the study of arithmetic and elementary algebra is made to precede that of geometry. The most able writers on the teaching of mathematics have insisted that it is not merely useful to teach arithmetic and geometry side by side, but that it is indispensable for maintaining that unity and coordination in mathematics which is one of its most valuable properties. This must be understood to mean not that the logical reasoning of Euclid is suitable

for the grades, but that it should be preceded by a preparatory training in constructive or inventional geometry, parallel with the study of arithmetic. It is undoubtedly due to the fact that for centuries geometry has meant Euclid's canon that its study has followed arithmetic and elementary algebra as requiring greater maturity of mind. The argument for an early introduction of geometry rests on the principle that in order to think the mind must be furnished with ideas, and that to prepare for an intelligent study of geometry, the child at an early age should become familiar with the elementary ideas of simple geometric forms.

Of recent years the value of drawing as a means of self-expression has come to be generally recognized, and together with music and physical culture constitutes a prescribed training as it did centuries ago in the school of Pythagoras. The value of geometrical drawing as applied to the interpretation of a problem is that it leads to clear ideas of certain truths to be established, and may also be used to develop definite mathematical concepts, thereby preparing the mind for connected thought.

Beginning with the object teaching of the kindergarten and primary we may therefore proceed by way of constructional drawing, to induction from concrete problems, but without formal demonstration, until we finally arrive at the high school stage of logical demonstration of abstract relations. Thruout the entire course, geometric training is unique in that its value depends very largely on the ability and resourcefulness of the teacher. The cause of this becomes apparent when we observe that comparatively few people when confronted with a complex statement are able to distinguish between what is essential and what is non-essential, and are equally unable to follow a connected chain of thought for any length of time. The chief defect in their mental equipment is undoubtedly lack of the power of concentration. This power is, in fact, the criterion which distinguishes the trained from the untrained mind. Since geometry is absolutely dependent on concentration, as well as the means by which it may be developed, two things are

apparent, namely, the difficulties which confront the teacher of geometry, and the value of efficient teaching to the mental development of the pupil. The first is the main argument for spreading out geometric teaching by making it penetrate downward thru the grades. Whatever may be the mental processes involved, it is certain that ideas become real only by degrees, and that until they do become real, the mind has no control over them.

The teaching of geometry in the grades naturally looks forward to the third, or high school, stage of instruction. This high school stage consists in the transition from objective relationships to a connected sequence of reasoning leading from one result to another. This involves at the outset the acceptance of certain axioms, and postulates as a foundation on which to build. What these shall be is a question on which much of the value of geometric teaching depends. The first conditions which such postulates must satisfy is that the child must be convinced of their truth without the aid of measurement of any kind; and, conversely, every statement which satisfies this condition should, at this stage of instruction, be regarded as a postulate.

The fallacy of using measurement as a means of geometric proof has been frequently pointed out. Measurement can be only relative; is subject to human limitations which make it an approximation at best; and can never be regarded as proof of any logical relationship; whereas the chief value of geometric reasoning is that it is a property of mind which transcends the material, and that its conclusions are therefore unassailable. The use of measurement as a substitute for geometric reasoning is therefore not only inefficient as a method but actually harmful in its effect on the pupil.

The definition of postulate just given naturally separates the subject matter of high school geometry into two groups: The first group comprises those statements which the child at this stage accepts as true without question, and which by reason of this fact are regarded as postulates. The second group comprises all geometric relationships not obvious on inspection, and the truth of which must be verified by logical

reasoning. This division is not the one adopted by Euclid, nor is it the one advocated by those professional mathematicians who demand rigor at every stage. Experience in teaching, however, has proved, that children appreciate rigor only when it leads to some intelligible result, and an attempted proof of some relationship which was obvious at the outset is confusing to their ideas and leads nowhere. The place of rigor in high school geometry, then, is in building up a strictly logical sequence from admitted facts, leaving the consideration of the sufficiency or redundancy of those facts for the fourth, or university, stage of development, when the mind is sufficiently mature to be critical.

Statements which with children of high school age may be regarded as postulates are such as the following:

The equality of vertical angles;

The bisection of a circle by a diameter;

Properties of figures evident from symmetry or resulting from superposition.

It must be kept in mind that the object in teaching geometry at this stage is to develop the conception of a logical chain of proof. Every theorem therefore should prove some new relation, not directly obvious, nor apparent from symmetry or superposition. In preparing the subject matter it is desirable to arrange the theorems in related groups such that each group constitutes a unit which can be grasped in its entirety. For example, the properties of polygons, circular arcs, and tangents can be arranged in one group; regular polyhedra in a second group; the tetrahedron, cone, sphere, and cylinder in a third group, and so on. Of course, every textbook attempts some grouping of theorems, but the sequence usually followed is the one established by Euclid, which altho unrivaled as a logical sequence, is not necessarily the best from a pedagogical standpoint. Euclid endeavored consistently to reduce the number of postulates to a minimum, and to introduce each as late as possible, a method which is inconsistent with the teaching plan here presented of accepting as postulates all intuitions, or unquestioned facts of experience. Besides its educational value, this plan

has the further merit of economizing time and effort, and also permits the introduction of the most important parts of solid geometry in connection with the study of plane geometry.

In considering the teaching of geometry we have so far been concerned with the time-honored geometry of the Greeks as crystallized by Euclid. Perhaps it is not too much to say that few high school teachers of geometry have any clear idea as to the nature and possibilities of modern geometry. As a matter of fact, however, modern geometry is more powerful as a method and more far-reaching in its applications than the simpler formal logic of the ancient Greeks. However useful Grecian geometry may have been to mankind in the past, there can be no question but that modern geometry is more in accord with the rapidly growing complexity of modern civilization. The term modern geometry as used in this connection is intended to include synthetic and projective geometry, vector analysis, descriptive geometry and non-Euclidean geometry.

The chief object in revising our present teaching of geometry by altering its content and extending it downward into the grades, is to relieve the high school course sufficiently to permit supplementing our present curriculum by including the elements of modern geometry. It has long been recognized that the mathematical curriculum should be unified and coordinated, but without any very definite progress being made in this direction. Modern geometry opens the way to the accomplishment of this result. Algebra as now taught is presented as a generalized arithmetic in that its processes are confined to pure number. A larger view of algebra can be given by applying its operations to vectors, or directed lines, while at the same time this coordinates the subject with geometry to their mutual benefit. By applying simple algebraic relations to vectors it is possible to prove geometric relations, such, for example, as the median properties of triangles. This gives the true idea of algebra as a language with more than one interpretation, and as relevant to any field of human thought. The geometric interpretation

of imaginaries and complex numbers affords another link between algebra and the geometry of two dimensions, as well as involving the elements of trigonometry. The elements of synthetic or projective geometry afford another notable opportunity for broadening the geometric concept and presenting the idea of correlation. The ideas underlying projection and inversion involve correlation of two sets of entities such that the properties of one set may be inferred from those of the other. The value of such a principle in our increasingly complex social life is a fact that should not be overlooked.

The inclusion of these topics may at first glance seem impractical as demanding an increase in the time value assigned to mathematics. This, however, is not intended. The suggestions here made do not contemplate any widening of the time limits. In order to make room for geometry in the grades, much of the written work in arithmetic may be replaced by rapid mental and oral drill, which would necessarily cut down the time limit by reason of the quickness with which such concentration produces fatigue, while at the same time, such intensive effort would increase the efficiency of instruction in arithmetic. This would permit of more concrete geometry being given in the grades, in accordance with the plan here outlined, and this in turn would simplify the teaching of geometry in the high school. Furthermore, the acceptance of postulates as indicated above would save the time now spent on their formal proof, while a fifty per cent cut might be made in the number of theorems actually proved without the loss of anything essential, and with a distinct gain in breadth of view and power of attack, provided the time so saved was devoted to modern geometry.

Probably the chief difficulty to be met in putting into effect such a modification of the curriculum is that the teacher of geometry would need to have a broader preparation than that demanded at present.

S. E. Slocum

University of Cincinnati

VII

THE EXAMINATION AND THE LEARNER

A great deal has been said and written about the faults and failures of examinations. They have been denounced as means for wrecking human health and happiness, and some educators have been inclined to doubt the right of their existence in the school routine. By such critics the examination has been considered merely as a means for measuring achievement and ability. This, moreover, is the popular conception; and for this conception the current educational practises are in part responsible. The real and fundamental office of the examination, however, is to aid the learner. Time was when one aspect of this function was duly recognized, when the examination had a strong defense as stimulus for study and review. But this lonely fortress was shattered sadly on the rise of "motivation." Even some strong forces in the present ranks of educators trust to interests and aims in life to attack and capture all that is worth the learning.

This would suffice if youth were age in miniature. But it is not, and probably the choicest contribution of child psychology is this fact that it is not. The child has ideals, motives, habits, sense of values, and, in short, behavior, quite peculiar to himself. He measures everything by his past experiences, and his values always have a setting in the present. This shortsightedness, which is most strikingly characteristic of the child, decreases with the increase of the learner's age and experience. But it never reaches zero, for sufficient evidences bear testimony to the adult's habits of measuring in terms of present values. The average person loses patience with his enterprises if no immediate results obtain to goad him on. The college student never works quite so hard as when he faces an examination, even tho in his whole course he has been seeking most earnestly to

fit himself for specific fields of life. The graduate student finds himself neglecting numerous details which he well knows would be of certain value in real life, but the knowledge of which does not suffice to call forth his best efforts. Even the remote "finals" at the end of a few years may not be sufficient stimuli. Indeed, the system of no examinations until the candidate comes up for his degree, which is in vogue in some universities, is hardly psychological. The college, university, and technical school, however, have been recognizing shortsightedness in the maturer student, by the fact that, in spite of some lenient elective systems that prevail, students are compelled to master certain general fields of knowledge. Even the regular graduate student finds some rather rigid limits to the field which he can choose if he desires a higher degree. These limits may not be quite right; yet the most liberal educator hardly would throw down all the bars and leave alone to motivation the choice of the student's pasture. Shortsightedness, then, is a common attribute of human life.

Therefore, something in addition to mere appeal to future motives seems necessary at times to urge along the average learner; some means whereby his future needs are made comparatively more immediate. When the teacher of physics, say, proceeds with demonstration of electricity as far as the students can, with their general knowledge of the subject, understand, and thereby works up a high degree of interest, he does well; and if he so leads them, that when the place is reached where their intelligent procedure demands a pause for study of certain basic principles and mathematical application, they master these, he is reaching toward the zenith of his function as a teacher. It must be admitted, however, that with the present status comparatively few fields so readily lend themselves to the appeal of motivation. Therefore something must be substituted when the more distant motives fail. Of course, the substitute would be more or less artificial, whereas the type of education that would seem ideal would create natural situations where every lesson learned would be used so frequently

that it would never be forgotten and nothing would be learned before the time for its utility. Once this utopia has been realized examinations in their present meaning will be obsolete. Each successive step in doing, then, will automatically examine, restudy, reorganize, and recall the necessary past experience. This ideal, however, is far remote, in its reality, because we can not hope to change our present modes of learning suddenly, and, furthermore, life is so complex and each present act involves so many earlier phases of behavior, that the choice of ideal procedure by the learner would be somewhat of a puzzle. Until this ideal has been reached the learner must be induced to store up a large supply of facts and principles in readiness for future use, to master a system of theories to be tested and applied in some remote time. Hence the need of every possible incentive which, if artificial, can be supplanted gradually by natural motives. To be sure, the examination is artificial, but in so far as it stimulates intensive, systematic study, efficient learning, and retention of what has been learned, temporarily at least, it is perhaps the most efficient factor at our service. So much for examinations as an incentive.

The next step in order is to point out some specific and effective applications of examinations as aids in learning. Not merely does the examination stimulate the learner generally, but it also helps determine his specific interests and behavior. The curriculum determines rather fully what general fields of things the child, in his regular school routine, shall attend to; it aims to select what ultimately will be useful to the child. But the child, because of his shortsightedness, may not evaluate as useful many really fundamental things within these several fields of study. If, on the other hand, in lieu of a natural program, some immediate demands for use of information about the facts in question is made, if the child feels himself compelled to stand ready to give an account of what comes within the possible field of his perception, he will soon develop the habit of attending to that which he knows he will probably be held

accountable for. The examination, when properly applied, constantly reminds the learner that he is responsible for the mastery of what is presented for his learning. Such an examination would have consideration for the falsity of the assumption that to do a thing or to be exposed to a situation is to know that thing or to react to that situation. For a few centuries it was believed that to know meant to do; but the leading moralists and educators today are hardly satisfied with this Socratic dictum. They are not willing to trust in proverbs and moral maxims merely, but they are seeing to it that situations are created whereby the child acts right. Hence the emphasis upon manual training, the household arts, and the creation of life situations in the school.

But another bit of tradition, that to do is to know, still has very general approbation. Recent studies of incidental memory have disrobed the fallacy of this very prevalent assumption. Even common observation testifies that we may do, hear, see, and use things a thousand times without knowing them in simplest details unless while they are within our range of possible experience, we have some need of their intimate acquaintance. To be exposed to a situation is no surety that one will react to it, and only when a reaction is elicited is there any real experience, *i.e.*, any real learning.

The still clinging claims for culture by means of a few years' exposure to Greek and Latin, the proverbial class-paper in college, numerous home work assignments that demand much mere copying and provoke dishonesty, the long English composition to be written outside of class, the much-wasted time at blackboard recitation, the overemphasis upon extensive formal outlines and notebooks, the mere perfunctory laboratory experiments and records, the acceptance and demand by most colleges of laboratory notebooks as ample evidence of the owner's knowledge of that subject; all are based upon a false assumption, in so far as no demands are made for further proof of the learner's mastery of these subjects than the sheer possession of these

generally mechanical records which are ofttimes monuments to wasted time and energy. These forms of practise, however, may all be indispensable devices if some means obtain whereby their intelligent performance is assured; but some motive more immediate than life's distant needs are necessary for such assurance. Examinations help assure the proper response to the essential situations, or, learning of the proper things.

Expectation of examination, furthermore, demands restudy of things once learned. The more frequently a problem is attacked the more numerous are the avenues of its approach and the greater are the possible associations formed, whereby the bond between response and situation is more firmly fixt. Such expectation further means reorganizing, a redistributing of emphasis upon essentials and a dropping out of the less relevant. All these factors mean greater possibilities of retention, *i.e.*, of recall when needed. But the greatest and most universal contribution of the examination to the learner's progress is in helping him retain what he already knows by stimulating him to reproduce what he has learned before it is forgotten. In a study of Recall in Relation to Retention made by the writer on several hundred school children, he found that at the end of thirty minutes after writing a number of words, a group of students that had twice recalled the words in the meantime gave twenty-five per cent more than a similar group who had had no intervening recalls. He then concluded that the learner would "profit greatly by frequent recalls of things he has learned, while the material is fresh in mind, rather than have long and arduous reviews that require an extensive restudy of the material once learned." The examination constantly reminds the learner of his need of continued, or of greater, effort, helps assure his mastery of details otherwise neglected, stimulates restudy and best of all, without restudy, the examination aids his retention.

The next point to be considered is the attributes of an effective system of examinations. First, there should be an overlapping, a continuity. This attribute, however, is

hardly evidenced by the current system. It is a common custom in the secondary schools and colleges and, alas, too often in the grades, to give long examinations after intervals of one or several months. The student then may go thru cruel cramming sieges and after the examination he may be happy to forget what he has thereby learned. The field then covered is covered for all time. Too well one knows the attitude of students toward subjects they have already past. A reference to these subjects may provoke a spirit of disgust. "We have past that; we are not supposed to know it now," is the attitude. The learner should be made to profit widely by his own mistakes. Some students, after the examination of the current type, are eager out of curiosity to know how well they answered. Some positively avoid talking or thinking about the examination that is past, but try to wholly rid their minds of it, and some are indifferent. None perhaps feels a real need of knowing the correct answers. But suppose they knew that they would be liable in the future to a test on all or part of the same questions. Then to be safe they would strive hard to master those parts in which they had failed. Indeed, it is a good thing to purposely repeat questions which had been asked in a previous test. The student then should always feel responsible for all he has learned. For him no field should ever be completely covered. The examination, scientifically applied, will help satisfy this need of recall, until the curriculum will have been such that life will constantly make the student recall what he has learned in school, and that the school will compel the student constantly to recall life's experience. Hence the examination should be frequent, should demand recall of any part of the field once covered, should overlap, and should generally be given unannounced. The error in respect to temporary mastery above referred to seems to obtain not merely with whole subjects but with their parts, and daily sections. Studies by Norsworthy and by Woodworth indicate that the individual who recites best at first recall will retain the most for future recall. Some evidence in favor of a purpose to

remember things for future rather than for present needs, are cited by Aal, and by Boswell, and Foster. In fact, we have common observation to suggest that many a student who strives hard to make a brilliant recitation daily, often resorts to artificial means whereby he can readily reproduce what he has learned after a brief interval. One very prominent device is to visualize and to remember by the position on the page. It certainly makes a tremendous difference to the learner whether he is preparing the lesson for the present recitation or for future purposes as well. If he learns for permanent use he will strive to make as many meaningful associations as he can, to tie it up with fundamental truths that are familiar, and to enlarge its meaning in every possible way. The cramming for daily recitation is as pernicious as it is for finals and even more, perhaps. The incentive offered in many schools by way of exempting from final examinations those students who make high grades in daily recitation is a grave misfortune to the fortunate student, for he is thereby encouraged to resort to mechanical devices that are oftentimes a hindrance to real learning. This fact may suggest one explanation of why the exempted student frequently does not pan out in life so well as some of his weaker classmates. Frequent tests, unannounced, given from the viewpoint of recall, on any part of the subject learned, would help avoid this daily cramming evil.

It is of no little consequence that most examinations be given unannounced. This is quite contrary to the current systems. Many students of secondary schools and colleges are taught to consider it an injustice to be given a test, even in regular class work, without a few days' warning. In one of the largest universities of this country a sophomore class marched out of the classroom in a body when a certain professor, a few years ago, surprized them by starting to give a brief examination. This new professor soon learned that he had violated a sacred precedent of that department of the university. Of course, the average student will feel it an injustice not to know when he is to be called to account for what he knows. He needs to be taught, however, by regular

practise all along the line, that he must be ready always. Furthermore, he must be ready to recall not only what he has just learned but he must also stand ready to reproduce any part of what he has already mastered whether it was learned a day before, or several months before. Life demands constant recall of any part, or of all of one's experience at regular intervals. Moreover, life demands quick and immediate recall of one's best experiences to solve situations that come unannounced. The one who best succeeds in life is he who has at his command always every bit of past experience organized and disciplined for instant service in any possible emergency.

The student should be trained to recall what he knows on short notice. To this end the examination should demand working against time. Most of all it should demand learning against time. Some recent studies by the writer in this field have shown a marked gain in learning by a group who studied with a knowledge that their time was limited, over a similar group who studied for the same length of time but did not know their time was limited. This one great secret of efficiency in the industrial world has hardly been given a chance in the world of learning. If the student knows his time for any test will be limited, in his preparation he will habitually organize the material so as to be ready to give the greatest amount of information in the shortest time. Furthermore, he will learn to economize words in expression and will consequently develop habits of brevity. One of the greatest ills of the pupils' written work which the average teacher's methods foster is verbosity. The prevalent mode of writing long compositions outside of class, with the privilege of using all the time and space desired is the English teacher's contribution to this ill. Some English teachers, however, awake to this fact, assign topics to be studied outside of class but to be written upon in a limited time in class. The examination then should be such as to encourage habits of conciseness.

The discipline that comes from recall in a limited time and on short notice develops habits of quickly marshalling

one's mental forces and necessarily makes one while learning constantly mindful of the fact, that what one learns, will have to be learned not merely for one occasion, not merely for one recitation, or for one examination, but for times whose number will depend upon the variety of experiences and the length of one's life.

Moreover, as a rule, examinations should be brief. In a much-used text of *School hygiene* one reads: "An examination in the upper elementary grades should not last more than an hour and a half and in high school it ought not to exceed two hours." The implication is that examinations are even longer than these intervals. This all sounds as if in the Middle Ages. Not merely for humane purposes, but for efficiency, examinations should be two minutes, rather than two hours in length. From three to ten minutes is probably a good time limit in most cases and, *e. g.*, instead of ten questions that take ten minutes, or three minutes, each, ask one such question. But let the examinations then come often, every day or so. The incentive for study will be proportionally more and the student will have the reminder constantly. The written examination referred to in this paper would not displace the oral test. That oral test, too, would be considered best, if, in so far as possible, the principles suggested for the written test could obtain. Objections to the above proposed scheme will be expected. That all examinations are more or less artificial has been admitted, but until the whole curriculum correlates perfectly with real life the examination offers perhaps the most expedient substitute to help attain the end desired in learning.

The plan seems to increase the burdens of the teacher. This is not necessarily true. Indeed, such a plan may lesson them. Her tasks thereby certainly would be more evenly distributed. The average teacher, especially in the secondary schools and colleges, several times each year, must spend a week or two grading stacks of long, tedious papers. She is often puzzled in the grading of a paper of six or a dozen answers to questions which can hardly be of equal weight.

On the other hand, if each day or two, she would spend some time grading papers that are concise, on one topic, which thereby demand but a few moments to each paper, the tasks would be less irksome. Not all the tests need to be graded. Let the student know that only a part, say a half or even a third of these tests, will be marked; let those tests for grading be selected by a strictly followed schedule which is based on chance selection, so that the student never will know which test will be neglected. The other tests the teacher could glance over to discover the type of general errors which could be discust in class. To be effective the graded papers should be returned promptly. Let no teacher here delude herself that she dares grow lax and seldom grade the papers. It is the belief of many a student that all or most of his papers are thrown into the waste basket and his grades guessed at. Probably he has had some ground for his belief. Doubtless many students who fret and worry in attempts to present good papers, if they only knew, are merely robbed of so much time and effort.

Suppose in the current system every teacher is conscientious; even then, there is tremendous waste of student's time. The final means complete suspension of regular class work for a week or two. Where the finals come several weeks before the end of a school term, then from the end of the examination to the end of the term the school work generally is little better than a farce. The suggested plan would have no place for finals. Some would argue that the plan would be unfair to the slow student. Rather it may be just what he needs to stimulate him and to arouse him from his lethargy. For any one the most urgent needs call forth the best he has. Furthermore, it will urge the student to organize and classify what he knows for momentary readiness—the one thing the slow student lacks.

But it will be a nerve wrecking device is the final cry. No; that is just what the plan seeks most to avoid. Some hygienic arguments against the present system have good bases, for many children, as well as adults, are injured by fretting over finals. It is not the examination that harms; it is the

anxiety while awaiting them and preparing for them. They come too seldom for the learner ever to be accustomed to them and their decision is too tremendous in determining pupils' fate. But the system of short tests, given very often, unannounced, that permit no cramming, would habituate the student to be tested any time, and would be about as commonplace as a daily recitation. The learner would thereby be constantly reminded of his difficulties but would have many later opportunities to prove himself. Just as soon as writing is perfectly automatic, the child should become habituated to written tests and long before, to short oral quizzes; and this habit never should be allowed to die.

To reiterate, the examination is an indispensable device to help motivate in study and review, by transmuting future values to the present, by reminding the learner always of his shortcomings, and by assuring a rather strict attention to details otherwise neglected. To this end examinations, as a rule, should be brief and frequent, should be given unannounced, should demand working against time, should overlap, so as to demand recalling and reorganizing of any part of things once learned, and never should be final.

GARY C. MYERS

BROOKLYN TRAINING SCHOOL FOR TEACHERS

DISCUSSIONS

THE WORDS SCIENCE AND PHILOSOPHY[1]

A few weeks ago the proposal to institute in the University of Oxford the new degree of Doctor of Philosophy—a proposal which has been accepted by Congregation—received the valuable support of Professor Case in a letter published in the *Times*. He points out that we have in England a tendency to popularize technical terms so as to pervert their legitimate meaning, and he expresses lively regret at what he holds to be the use of the word science in an unjustifiable sense by Professor Armstrong and by the high authority of the Ministry who appointed the Royal Commission on Science. I quite agree with the President of Corpus that English carelessness about technical terms tends to sanction an arbitrary abuse of language, and has led to an improper use of the word science, confining it to those branches of knowledge which are more correctly called "the natural sciences."

I say more correctly since, in the charter granted by King Charles II. to the founders of the Royal Society in 1663, that society is entitled *Regalis Societas Londini pro scientia naturali promovenda*. This was translated at the time into English as The Royal Society of London for the Promotion of Natural Knowledge. In later times at both Oxford and Cambridge the term natural science has been with general approval substituted for natural knowledge. On the other hand, there is early and weighty precedent for the use of the word science, without further qualification, to signify the knowledge of nature or natural science. The Académie des Sciences was founded in Paris in 1666 with that limitation of the word science which has been consistently maintained. The Académie Française, the Académie des Inscriptions et Belles-Lettres, the Académie des Beaux-Arts, and the Acadé-

[1] From *School World*, London, England, April, 1917.

mie des Sciences Morales et Politiques (a recent addition) exist alongside of it as constituents of the Institut de France. The use of the word science as limited by the founders of the French Académie des Sciences has been largely followed by other national academies thruout the world, tho the Academia Regia Scientiarum of Berlin—reconstituted in 1812 as the Akademie der Wissenschaften zu Berlin—has four sections, namely, physical, mathematical, philosophical, and historical. It thus appears that the Royal Commission on Science of 1870 can not justly be accused of audacity in its limitation of the word science, as the President of Corpus would have us believe, since it was following the practise of the French and many other celebrated academies.

Moreover, the well-known fact that the word science was formerly applied at Oxford to the works of Aristotle scarcely justifies the contention of the President that the term science has been used from Aristotle downwards for the systematic and methodical study of a subject, nor indeed can the President wish to lead his readers to believe what his words imply, namely, that this Latin word was known to and used by Aristotle!

Whenever it is possible, without pedantry, to use the term natural science in place of the abbreviated form science, English writers no doubt should do so. But the French Academy, our newspapers, the Royal Commission, the term scientific method, and the modern word scientist (which has the high approval of Whewell in his *Philosophy of the inductive sciences*) have made it a difficult thing in practise.

The English-reading public understands by the word science, especially if printed with an initial capital, natural science. A writer must not offend his readers by irrelevant scruples as to the correct use of words. We all submit to Art, with a capital initial, as meaning something quite different from the art of all handicraft, and from that which is pointed to in the words artful and crafty. We accept it as something other than the arts, which are sometimes con-

trasted with the sciences and sometimes paired off with them in couples. Bearing more closely on the proper use of the word science is the use of the word arts to signify the subjects of the *studium generale* of the medieval university, since of these it was said: "The sciences are the arts of the mind."

The President of Corpus says, in his letter to *The Times*, that the mental and moral sciences are sometimes too narrowly called philosophy. It is unfortunately true that this fine old word has acquired a misleading usage in modern English. There is no better justification for restricting it to what the pupils and editors of Aristotle called metaphysics than there is for excluding the study of mental phenomena from the application of the word science. The founders of the Royal Society called the natural knowledge at which they aimed the New Philosophy, and until the later years of last century Natural Philosophy and Experimental Philosophy were terms applied, at Oxford and elsewhere, with deliberate appreciation of their significance, to the study of physics. Whewell is an important authority for the wide and comprehensive use of the word philosophy. The wise men of early times and the ancient Greek philosophers were, in intention, investigators and discoverers of the order of nature.

The so-named Philosophical Faculty of the German universities includes the professors of the various natural sciences, as well as those of moral philosophy, history, language, and mathematics. On the other hand, it was under the theological domination of the Middle Ages that the conception of philosophy became perverted and restricted by the elaborate ingenuities of the schoolmen, whose purpose was to harmonize Christian theology with the logic of "the philosopher," by which title they called Aristotle. A later use of the word philosophy has harked back to medieval example and tended to the narrowing of its signification in an undesirable way, so that many wrongly apply it at the present day to the studies of the metaphysician alone, whilst excluding from its area those of the physician and the physicist. The

institution by the University of Oxford of the degree of doctor of philosophy to include more things in heaven and earth than are dreamt of by conventional philosophers will be a real progress in nomenclature and organization.

E. RAY LANKESTER

JANE AUSTEN

[The centenary of Jane Austen has called out renewed interest in her life and writings as well as much discussion regarding her place in English literature. We know of nothing better to commend to the attention of teachers of English literature than the following article which appeared in the Literary Supplement of the London *Times*.]

The time has come, surely, when there is no need to bring witnesses to prove Jane Austen's fame. Arrange the great English novelists as one will, it does not seem possible to bring them out in any order where she is not first, or second, or third, whoever her companions may be. Unlike other great writers in almost every way, she is unlike them, too, in the very slow and very steady rise of her reputation; it has been steady because there is probably no novelist of the nineteenth century who requires us to make so little excuse for her, and it has been slow because she has limitations of a kind particularly likely to cramp a writer's popularity. The mere sight of her six neat volumes suggests something of the reason, for when we look at them we do not remember any page or passage which so burnt itself into our minds when we read it first that from time to time we take the book down, read that sentence again, and are again exalted. We doubt whether one of her novels was ever a long toil and stumble to any reader with a splendid view at the end. She was never a revelation to the young, a stern comrade, a brilliant and extravagantly admired friend, a writer whose sentences sang in one's brain and were half absorbed into one's blood. And directly one has set down any of the above phrases one is conscious of the irony with which she would have disclaimed any such wish or intention. We can hear it in the words addrest to the nephew who had lost two chapters of his novel. "How could

I possibly join them on to the little bit (two inches wide) of ivory on which I work with so fine a brush, as produces little effect after much labor?"; and again in the famous, "Let other pens dwell on guilt and misery. I quit such odious subjects as soon as I can."

But however modest and conscious of her own defects she may be, the defects are there and must be recognized by readers who are as candid as Jane Austen herself would wish them to be. The chief reason why she does not appeal to us as some inferior writers do is that she has too little of the rebel in her composition, too little discontent, and of the vision which is the cause and the reward of discontent. She seems at times to have accepted life too calmly as she found it, and to anyone who reads her biography or letters it is plain that life showed her a great deal that was smug, commonplace, and, in a bad sense of the word, artificial. It showed her a world made up of big houses and little houses, of gentry inhabiting them who were keenly conscious of their grades of gentility, while life itself consisted of an interchange of tea parties, picnics, and dances, which eventually, if the connection was respectable and the income on each side satisfactory, led to a thoroly suitable marriage. It happens very seldom, but still it does happen, that we feel that the play of her spirit has been hampered by such obstacles; that she believes in them as well as laughs at them, and that she is debarred from the most profound insight into human nature by the respect which she pays to some unnatural convention. There are characters such as the characters of Elinor Dashwood and Fanny Price which bore us frankly; there are pages which, tho written in excellent English, have to be skipt; and these defects are due to the fact that she is content to take it for granted that such characters and conduct are good without trying to see them in a fresh light for herself.

But the chief damage which this conservative spirit has inflicted on her art is that it tied her hands together when she dealt with men. Her heroes were less the equals of her heroines than should have been the case, making allowance

for the fact that so it must always be when a woman writes of men or a man of women. It is where the power of the man has to be conveyed that her novels are always at their weakest; and the heroines themselves lose something of their life because in moments of crisis they have for partners men who are inferior to them in vitality and character. A clergyman's daughter in those days was, no doubt, very carefully brought up, and in no other age, we imagine, were men and women less at their ease together; still, it rests with the novelists to break down the barriers; it is they who should imagine what they can not know even at the risk of making themselves superbly ridiculous. Miss Austen, however, was so fastidious, so conscious of her own limitations, that when she found out that hedges do not grow in Northamptonshire she eliminated her hedge rather than run the risk of inventing one which could not exist. This is the more annoying because we are inclined to think that she could have run almost all the risks and triumphed. In proof of this we might quote two passages from *Mansfield Park* (the first is quoted by Professor Bradley in his lecture to the English Association), where, forsaking her usual method, she suddenly hazards herself in a strange, new atmosphere and breathes into her work a spirit of beauty and romance. Fanny Price standing at a window with Edmund breaks into a strange rhapsody, which begins, "Here's harmony! here's repose! here's what may leave all painting and all music behind, and what poetry only can attempt to describe!" And, again, she throws a curious atmosphere of symbolism over the whole scene where Maria and Henry Crawford refuse to wait for Rushworth, who is bringing the key of the gate. "But, unluckily," Maria exclaims "that iron gate, that ha-ha gives me a feeling of restraint and hardship. I can not get out, as the starling said."

But these limitations are noticeable only when Jane Austen is committing herself to saying seriously that such things and such people are good, which in the works of any writer is a dangerous moment, leading us to hold our breath; when

she is pointing out where they are bad, weak, faulty, exquisitely absurd she is winged and inapproachable. Her heroes may be insipid, but think of her fools! Think of Mr. Collins, Mr. Woodhouse, Miss Bates, Mrs. Norris, Mrs. Bennet, and in a lesser degree of Mrs. Allen, Lady Bertram, Sir William Lucas! What a light the thought of them will cast on the wettest day! How various and individual is their folly! For they are no more consistently foolish than people in real life. It is only that they have a peculiar point of view, and that when health, or economy, or ladies of title are mentioned, as must frequently happen in the world we live in, they give vent to their views to our eternal delight; but there are a great many circumstances in which they do not behave foolishly at all. Indeed, we are inclined to think that the most painful incident in any of the novels is when Miss Bates's feelings are hurt at the picnic, and, turning to Mr. Knightley, she says, "I must have made myself very disagreeable or she would not have said such a thing to an old friend." Again, when they are discussing the study of human nature and Darcy remarks, "But people themselves alter so much that there is something to be observed in them for ever," Mrs. Bennet's reply is surely a stroke of genius. "Yes, indeed," cried Mrs. Bennet, offended by his manner of mentioning a country neighborhood, "I assure you there is quite as much of that going on in the country as in town." Such is the light it throws upon the muddled vacuity of the poor lady's mind that she ceases to be ridiculous and becomes almost tragic in her folly.

It came so naturally to Jane Austen to describe people by means of their faults that had there been a drop of bitterness in her spirit her novels would have given us the most consistently satirical picture of life that exists. Open them where you will, you are almost certain to light upon some passage exquisitely satirizing the absurdities of life—satirizing them, but without bitterness, partly no doubt because she was happy in her life, partly because she had no wish that things should be other than they are. People could never be too absurd, life never too full of humors and

singularities for her taste, and as for telling people how they ought to live, which is the satiric motive, she would have held up her hands in amazement at the thought. Life itself—that was the object of her love, of her absorbed study; that was the pursuit which filled those unrecorded years and drew out the "quiet intensity of her nature," making her appear to the outer world a little critical and aloof, and "at times very grave." More than any other novelist she fills every inch of her canvas with observation, fashions every sentence into meaning, stuffs up every chink and cranny of the fabric until each novel is a little living world, from which you can not break off a scene or even a sentence without bleeding it of some of its life. Her characters are so rounded and substantial that they have the power to move out of the scenes in which she placed them into other moods and circumstances. Thus, if some one begins to talk about Emma Woodhouse or Elizabeth Bennet voices from different parts of the room begin saying which they prefer and why, and how they differ, and how they might have acted if one had been at Box Hill and the other at Rosings, and where they live, and how their houses are disposed, as if they were living people. It is a world, in short, with houses, roads, carriages, hedgerows, copses, and with human beings.

All this was done by a quiet maiden lady who had merely paper and ink at her disposal; all this is conveyed by little sentences between inverted commas and smooth paragraphs of print. Only those who have realized for themselves the ridiculous inadequacy of a straight stick dipt in ink when brought in contact with the rich and tumultuous glow of life can appreciate to the full the wonder of her achievement, the imagination, the penetration, the insight, the courage, the sincerity which are required to bring before us one of those perfectly normal and simple incidents of average human life. Besides all these gifts and more wonderful than any of them, for without it they are apt to run to waste, she possest in a greater degree perhaps than any other English woman the sense of the significance of life apart

from any personal liking or disliking; of the beauty and continuity which underlies its trivial stream. A little aloof, a little inscrutable and mysterious, she will always remain, but serene and beautiful also because of her greatness as an artist.

CLASSICS AND THE REFORMER

At the present time it is quite the vogue to attempt to force upon the secondary schools some innovation which, according to the promoter, will solve all the difficulties in which the schoolmen now find themselves involved. To clear the ground for this panacea, it seems to be counted necessary to make a violent attack upon the standard subjects of the curriculum, and that too without taking the trouble to find out how these subjects are at present taught, or what is the aim of those who teach them.

This is particularly true of the attacks so frequently made upon Latin as a high school study. The critic is a generation or two behind the times, and takes it for granted that Latin is now taught under the same conditions and by the same methods which prevailed some decades ago. The people who are loud in denunciation of the study of Latin as savoring of monastic training would sustain a violent shock if they took the trouble to visit some classes in which Latin is being taught by the latest methods.

Before proceeding to a detailed examination of the present situation, a word should be said about the enrolment in Latin in the secondary schools of the United States; for the impression has in some way spread abroad that Latin is declining rapidly as a high school subject. Be it known then that, according to the statistics collected by the United States Commissioner of Education, the enrolment in Latin in secondary schools was 100,144 in the year 1890; in 1900 it had grown to 314,856; and in 1910 to 405,502. For a decaying subject, surely an increase of 300 per cent in twenty years is very encouraging, especially as in the last-named year the combined enrolment in all other foreign languages

(French, German, Greek, Spanish) fell 100,000 short of the enrolment in Latin.[1]

The impression that the Latin enrolment is falling off in the schools is doubtless due, in part at least, to a not unnatural confusion between absolute and relative increase. The constituency of the secondary school has not the solidarity it once possest; and all kinds and conditions of courses have been given a place in the curriculum to meet demand caused by the fact that hosts of students with varied aims now find it feasible to remain in school for additional years of training. Under these conditions it can hardly be expected that the enrolment in Latin will keep pace with the total high school enrolment; but a proportionate falling off may be quite compatible with an absolute numerical gain. For example, if a school doubles its enrolment, most of the new contingent electing a technical course from which Latin is excluded, the proportion of students in that school taking Latin will decline, but the absolute number electing the subject may be greater than before.

The college situation provides another illustration. Forty years ago a college that enrolled a total of four or five hundred students was thought a large institution; and all of the students in such a college may have been required to take Latin. It is interesting to note that, during this last year, the Latin enrolment each term at the University of California has averaged just a little above 500. In comparison with the total registration of the university this number looks small; yet it is a number equal to the total enrolment in a large college of half a century ago; and, farther, this enrolment is largely a matter of election, whereas in days gone by Latin was an absolute requirement.

For a clear understanding of the present situation, therefore, it is necessary, first of all, to recognize the large in-

[1] Later reports are at hand from two states. In California, where Spanish is much favored by local conditions, the report made by the State Commissioner of Secondary Education in 1915 shows that Latin leads Spanish, its nearest competitor by about fifty per cent. In Iowa, two years ago the Latin enrolment in the schools was 9,736; incomplete returns for this year show a total of 14,697.

crease in the Latin enrolment in secondary schools. Next should be noted the fact that the center of gravity in the enrolment has shifted in a marked degree. Time was when the Latin course extended over six or eight years; now the majority of students take but a two-year course. Exact figures for the whole field are not available; but such statistics as are at hand would indicate that of the students who begin Latin not more than a third elect the subject after the second year. In one state for which exact figures are available, the proportion is considerably less than this.

This shift in the center of gravity may be explained in part by the present crowded condition of the curriculum of the secondary school. But whatever the cause, the fact is here; and the reformer of the school curriculum betrays his ignorance and puts himself in a ridiculous position when he loudly demands that Latin be relegated to the scrap-heap because results are not secured which may have been forthcoming in the days of a six or eight-year Latin course. Thus, in a recent paper on *The Latin entrance requirement*,[2] President Guth, of Goucher College, contents himself with pointing out that the present Latin course in the schools does not ordinarily produce literary prodigies, and without further investigation, gives his verdict against Latin as a college entrance requirement.

And, in his article on *Parents and schools*,[3] Dr. Flexner first represents the Latin teacher as claiming that his subject is the only one that has disciplinary value. After holding up to ridicule this lay figure of his own creation, he proceeds: "The other conceivable answer to the question, Why, in reference to the study of Latin is culture." Under this head he reminds us that our boys and girls read six books of Virgil (the great majority of them, by the way, do not), and complains of lack of evidence of any unusual degree of culture resulting therefrom. With a sneer that he takes no pains to conceal, he concludes by advising the teacher of

[2] School and Society, iii. 72 (May 13, 1916), p. 701 ff.

[3] Atlantic Monthly, July, 1916, p. 25 ff.

Latin that "the cultural argument had better not be pushed," and that the disciplinary argument "is safer!"

Dr. Flexner's prejudice against Latin is manifest in all his writing that touches that subject; but, from a man in his official position, we should expect that criticism would at least be based on a full knowledge and recognition of the facts of the case. What teacher of the classics who is in his right mind would think of pushing the claim that a fine sense of literary appreciation can be imparted to the rank and file of students who spend one year upon the elements of Latin, and round off their course with a second year devoted to the reading of a Roman historian? The absurdity of this line of attack upon the subject of Latin is too manifest to call for further comment.

Before proceeding to set forth the advantages that may be derived from even a two-year course in Latin, it may be noted that both President Guth and Dr. Flexner manage to bring in a slighting reference to the use of the pony, as they elegantly express it. Neither of them mentions the fact that, in proportion to their difficulty, this same evil is encountered in the study of other foreign languages also; and perhaps neither of them is aware what steps have been taken by teachers of Latin to eradicate this abuse. The one sure remedy seems to be to condition promotion upon the student's ability to translate passages of Latin previously unseen but of the same general grade of difficulty as the text he has studied.

A long step was taken in the right direction by the Commission on College-Entrance Requirements in Latin in its report published in 1909. The recommendations there made have been viewed very favorably by the colleges. The report provides, for example, that the first four books of Caesar be no longer prescribed as the reading of the second year, but that any part of the *Gallic War* or the *Civil War* or of the *Lives* of Nepos may be used; so that, in the examination, the lightning may fall anywhere. This arrangement encourages and rewards honest work, and leaves the shirker in the lurch.

Aside from the acquaintance gained with the language itself, there are at least four values that may be developed even in a two-year Latin course. These will first be enumerated briefly, with discussion and illustration following:

1. The effect upon the student's power in the use of his native tongue. This does not necessarily mean a "graceful use of the mother tongue," as Dr. Flexner somewhere put it. It is meant that the study of Latin can be made to give the student an insight into the logic of speech, that it sharpens his apprehension of fine shades of meaning, that it helps him to grasp and hold the meaning of English words, and that it is not without bearing even upon his spelling; *e.g.*, Latin *nauta* fixes the spelling of English nautical. There is nothing occult or mysterious about this; it is just as simple and practical as anything could be.

2. The laying of a broad and adequate foundation for the study of other foreign languages, notably Spanish and French. The knowledge of Latin forms, syntax and vocabulary is here a master-key, as teachers of the Romance languages are coming more and more to insist. The chance of cooperation at this point is specially large, because, as pointed out above, the Latin enrolment is massed heavily in the first two years of the high school course.

3. Disciplinary value. Here again there is nothing occult or mysterious. All that is claimed is that Latin is not a play subject; it calls for honest downright application. It will require a vast deal of theorizing to eradicate the common sense view, based on actual observation, that there is real value in this sort of training.

4. Cultural value. No extravagant claim is made under this head. It is perfectly true that two years of Latin training can not be expected to transmute a ploughboy into a Milton; but that even a two-years' course in Latin can be made to open up new mental vistas to students of the rank and file will be shown by concrete illustration as the paper progresses.

In regard to these four values that may be developed in a two-year Latin course, it should be noted that (1) and (2) in particular fall almost altogether outside the realm of controversy about general discipline and the technical question of transfer arising therefrom. Modern education seems

to be asking everywhere: What can you do? And Dr. Flexner keeps insisting that a subject can justify its position in the school curriculum only if it serves a definite purpose. Could anything be more definite than (1) and (2) above?

In regard to the matter of disciplinary value (3), anyone who has to do with the training of children and uses his powers of observation to any advantage will have little difficulty in arriving at a safe conclusion. But as a matter of academic discussion, this whole subject has been in dire confusion ever since the psychologists some years ago proclaimed the discovery that there is no such thing as transfer, and that, therefore, the doctrine of mental discipline is a fallacy. This discovery, so-called, was advertised widely and used very extensively in the attempt to overturn tried and proved courses of study. It is not by any means so well known that the psychological experiments were continued, and with very different results. Ebert and Meumann, Coover and Angell, Winch, Bennett, Fracker, and others have found transfer of discipline in a marked degree. Of the earlier experiments, Professor L. W. Cole, of the University of Colorado, says: "The conclusion should have been not that transfer does not occur, but that the method was too crude to detect it." [4]

How professional opinion is thus shifting back again to the only point of view possible on empirical grounds is illustrated also in Judd's recent volume on *The Psychology of high school subjects*. In particular, the passage headed Farewell to Critics of Formal Discipline, page 435, should be read in this connection. Educational theorists have so long rejoiced in the possession of the no-transfer theory as an effective weapon against conservative and sound methods of teaching that they are naturally disturbed to feel the bludgeon slipping from their hands. Dr. Flexner is, of course, aware of the present state of the theoretical discussion, and his reluctance to admit the fact is rather amusing. He must concede that there may be a little something in the doctrine of transfer, and suggests the daring illustration that

[4] University of Colorado Bulletin, XIV. No. 9 (September, 1914), p. 14.

a student who had studied some Chinese might find it easier to continue study along that same line (would this, by the way, be technically a case of transfer?). He will go even farther, as may be seen from the generous abandon of the following: "It seems *not improbable* that the learning process has *to a slight extent* general as well as special consequences." [5]

Before touching on the possible cultural value of the two-year Latin course (4), it may be remarked that the whole problem of Latin as a high school subject would be much clarified if it were frankly recognized that the secondary field is now rather definitely marked off into three departments—academic, industrial, and commercial. Few would question that there is a place in the academic school for a four-year Latin course that may lead to farther study of the language. The industrial schools are not all of one type; but in the polytechnic variety the curriculum is so crowded and the constituency is such that hospitality for Latin can not always be expected. But there are many exceptions; for example, in the Manual Arts High School, Los Angeles, and in the Technical High School, Oakland, California.

In the commercial school there is still another situation. The curriculum must contain some language work, and the question is raised whether Latin shall be included. This is a new problem; and where Latin is admitted on trial, it seems to be admitted on a strictly two-year basis. The most interesting experiment in this field yet recorded is that made by Mr. A. S. Perkins, of the Dorchester (Mass.) High School. The experiment is still in progress; reports of results up to date have been made in three papers published in the Classical Journal.[6] That Mr. Perkins has faced his task squarely, asking and expecting no favors for his subject, will be clear from two short quotations from his articles:

[5] *Parents and schools*, p. 29.

[6] *Latin as a practical study* (Vol. VIII, No. 7, April, 1913, p. 301 ff.), *Latin as a vocational study in the commercial course* (Vol. X, No. 1, October, 1914, p. 7 ff.), and *The Dorchester experiment in vocational Latin* (Vol. XII, No. 2, November, 1916, p. 131 ff.).

The course in Latin must stand or fall according to the judgment past upon it from the vocational viewpoint. In other words, it is necessary to establish as a fact that the vocabulary of the commercial Latin pupils is unquestionably enriched, and that this enrichment makes for increased earning capacity.

At the outset, I had resolved that, whatever else the course might or might not become, it should at least be a serious study of the Latin language. Otherwise, pupils would better spend their time in a study of Latin roots and prefixes in connection with English.

It will be noted that the chief emphasis is upon the effect of the study of Latin upon the student's practical control of the English language. To measure results, a test was arranged as follows:

The first step was to select two sets of pupils of equal ability, one set in the second year of Latin, and the other in the second year of a modern language. Accordingly, we chose pupils such that each group had virtually the same average mark in Latin, on the one hand, and modern language, on the other, and also in English, with the result in actual figures, that the non-Latin group in the two studies averaged 0.5 of one per cent higher. To make doubly sure that the Latin pupils were not favored, the non-Latin group was taken from the section of Mr. Murdock, a classical scholar, who in his English teaching emphasizes the Latin element in the language.

Six measurements were made, covering the following details: spelling, use of words in sentences, definitions and parts of speech, meaning of words, and excellence in vocabulary. A detailed account of the tests is given, showing that every precaution was taken to avoid favoring the Latin group. Yet that group averaged 61.3 per cent and the other only 32.18 per cent.

Surely in a two-year course of this kind the conditions for developing a cultural value would seem to be unfavorable; and if it is developed here, certainly it can be developed anywhere else. It is interesting that this effect of the study seems to have come upon Mr. Perkins unawares. His attention was centered upon another aspect of the work, and he touches on this point very modestly. The course

was arranged to include some Virgil and other poetry. To quote from the report:

> This year, while they were studying Catullus's *Death of the pet sparrow*, . . . which, by the way, was found to be unexpectedly rich in words leading to English derivatives, a genuine sense of literary appreciation manifested itself. . . A year ago this sense of appreciation was noticeable during the whole of the latter half of the (second) year. . . It was the study of Virgil which interested them most—to such a degree, indeed, that several read the whole of the *Aeneid* in translation. In other words, the pupils seemed so hungry for something spiritual, some relief, as it were, from the matter-of-fact detail of their bookkeeping or commercial geography, that I am inclined to think the refining influence of the literature is one of the important features of the course.

There are, then, quite apart from the knowledge of the language itself, at least four arguments for even a two-year course in Latin: (1) the bearing of the training upon the pupil's power over his native tongue, (2) the foundation afforded for the study of the Romance languages, (3) disciplinary value, and (4) cultural value. All these values may be realized even in the commercial course.

Keeping in mind the threefold division of the field of secondary instruction into courses of study of the academic, industrial, and commercial types, it may be pertinent to inquire what is the meaning of the latest hue and cry to the effect that the study of words and the use of symbols is a heinous wrong. It looks very much as if our educational friends, finding their favorite weapon, the no-transfer theory, slipping from their grasp, are now applying a coat of paint to the old bludgeon, hoping thus to bring it into action again unrecognized. Someone has sounded the false alarm, and senseless parrot-like echoes can be heard on all sides.

But unless the higher processes of thought are to be eliminated altogether, is it not essential that the academic school, at least, study words and symbols? Or what sort of industrial school of the polytechnic type could be maintained, if study by means of symbols were abolished? Perhaps the

reformers are thinking particularly of the commercial school, and would rivet more firmly upon its less favored students the chains of the commonplace. Is it any less valuable and important to learn the general abstract principle, everywhere applicable, that eight times twelve make ninety-six than it is to learn that eight hogs at twelve dollars each will sell for ninety-six dollars? Is this so-called practical and cash-basis atmosphere the healthiest for young America? "But," says the reformer, "must we not prepare for life?" Assuredly; but is there no life above the level of the pig-sty?

In regard to the secondary school situation generally, one other point should be noted in this connection. In his article on *Parents and schools*, above referred to, Dr. Flexner makes a very clever attack upon the standard subjects of the curriculum by appealing to the vanity of the parent—for it is the "Intelligent Parent" to whom he addresses his remarks. This gratified individual is urged to go to the school teacher demanding to know Why. Dr. Flexner thinks it will go hard with the standard subjects if they are thus brought to book; but it should not be forgotten that it is a rather dangerous matter to urge people to question Why, unless you are on quite solid ground yourself.

The writer is himself a parent, and during the last fifteen years or more has had considerable opportunity to meet school people and parents (presumably intelligent), and it would seem that the school constituency is dissatisfied not so much with the standard subjects of study as with the fact that solid values are being crowded out of the school curriculum by the melange of novelties forced into it by educational theorists. The people are not so much questioning Why. Rather they are groaning How long? And while we are yet in the reign of the three F's (Fads, Fancies, and Frills), it may be prudent not to discharge too many Whys. It is well to remember that some guns have a dangerous recoil.

The recently announced decision of the Rockefeller General Education Board to finance, under the auspices of Teachers

College, Columbia University, a modern school of the type advocated by Dr. Flexner brings to a head a situation that should be faced with the utmost frankness. In the first place, the aim of the experimental school is frankly materialistic. Arithmetic is to be studied because thru it the student may learn how to reckon the interest on shares of stock; the modern languages are tolerated because the pupil may want to visit Europe at some future time, or perhaps he will engage in South American trade.

Second, the things which the ages have found to be uplifting and inspiring are to be relegated to the scrap-heap, because, by his own confession, the originator of the school finds that certain doors of appreciation are not open to him personally. The quotation of a sentence or two will make it necessary to say no more under this head:

> In respect to . . . literature, a Modern School would have . . . the courage not to read obsolete and uncongenial classics . . . We might thus produce a generation . . . that did not at school analyze Milton's *Lycidas* or Burke's speech as we did, who then and there vowed lifelong hostility to both.[7]

Third, Dr. Flexner has excluded the study of Latin from the experimental school without a knowledge of present aims and methods, or apparently, without even trying to find out whether the subject has any possibilities of value in the sort of educational program which he conceives to be demanded by the conditions of modern life. The depth of his prejudice is indicated by the vindictive absurdity of the following:

> Most students of Latin and algebra as a rule fail to learn these subjects; they fail even to make systematic efforts to acquire them. On the contrary, they fumble and stagger and guess all the way thru.[8]

Recently there was published in one of the New York papers an article headed *The Closed mind*, the writer ascribing this mental attitude to critics of the Modern School. Nothing is said of the narrow-minded prejudice that con-

[7] *A Modern school*, p. 17.
[8] *Parents and schools*, p. 30.

demns beforehand a standard subject such as Latin, and refuses it even a hearing in an experimental school in which practically all other high school subjects are to be tried out under the most favorable conditions that money can provide.

Finally, the moral effect of the exclusion of Latin from the experimental Modern School must be faced frankly. Intrinsically, of course, the value of an educational program is just as great whether there are millions of endowment behind it or not; nor is the intrinsic value of such a program in any way dependent upon the official position of the person who originates it. But the moral (or immoral) effect of these considerations is very large.

The unreasoning homage paid by the public to the unearned increment of prestige accruing from official position was brought home to the writer in striking fashion during the first year of his experience as a university instructor. Fresh from student life, and conscious of no change within himself, it was a startling surprize on the street to be greeted by an older man with a low bow and removal of the hat. It was somewhat disconcerting to find that he was expected to have opinions upon the orthodoxy of a professor of philosophy with whom he was not acquainted; and it was positively hair-raising to be suggested as a person who might donate his services as professor of Hebrew in a projected theological school. Finally it developed that a part of the duties of the first year was to visit schools, there to be received humbly and to advise graybeards old enough to be the visitor's father, not to say his grandfather.

It is hardly to be supposed that the General Education Board deliberately proposes, at this time, to throw the weight of its influence against the literary element in education, and in particular, against the study of Latin. But, prefaced as it has been by such intolerant articles as *Parents and schools*, it is not strange that the establishment of the experimental school has created a widespread impression that the General Education Board is behind a plan to revolutionize the country's school system at once, without waiting to see what results will be forthcoming in the Modern School.

If such were the fact, that is, if the Board, at the behest of one or two prejudiced and determined men, were planning to apply its resources to overturn a system of education that millions of people believe to be better than the one proposed, the issue between tyranny and academic freedom would be squarely joined. In view of the reports everywhere current, it would be well if the Board should take pains to make its position clear on this point.

The really fair and just thing to do would be to take Latin into the Modern School on the same basis as other studies, and to try out in particular the new methods that are just being developed and which promise so much for the future usefulness of the subject. The least that the Board can reasonably do, both collectively and as individuals, is to abstain from further attack upon subjects against which the action already taken is bound to create prejudice in the popular mind.

One other point must not be forgotten. It is reported that the country is to be canvassed to find the very best teachers for the classes to be organized in the Modern School. Anyone at all acquainted with teaching is well aware that a teacher who is a genius can make any subject live. From this two things follow: (1) No just comparison can be made between results obtained under such auspices in the Modern School and the results obtained in other places in classes conducted by teachers that are mediocre, uninformed, listless, hireling, or who owe their positions to personal or political influence; (2) Even tho, after a period of years, the sponsors of the Modern School are ready to officially announce it a success, it will not follow that the results obtained under favored conditions there can be duplicated in schools operated under average conditions.

A concrete illustration has been furnished in recent years by experiments with the direct method of teaching Latin. Many who saw Dr. Rouse demonstrate at Columbia University this method as it is used in England returned to their schools burning with zeal to emulate him. Most of them are sadder and wiser now. They found that they did

not have the requisite knowledge of the language; and, more important than all, they had not the personality and versatility of Dr. Rouse. Moreover, the administrative difficulty is extreme in American schools.

If it is desired to institute an experiment that is really decisive, the Modern School should include in its experiment all standard subjects, treating all with equal encouragement and consideration. The teachers of the classics would welcome such a trial. Probably the advocates of the utilitarian program of the Modern School would not look with favor upon such a competition conducted upon equal terms. Why?

H. C. NUTTING

BERKELEY, CAL.

VIII

REVIEWS

A Handbook of American Speech. By CALVIN L. LEWIS. Chicago and New York. Scott, Foresman and Company, 1916. Price $0.80.

The expectation aroused by the title of Professor Lewis's book is not satisfied by the content of it. Just what a handbook of American speech should be, it is perhaps not easy to say, since none has ever been written. But a handbook should be at least a summary guide, and American speech should presumably mean the English language spoken in America. Professor Lewis's book is neither a summary guide, nor are his observations based upon the language spoken in America.

The *Handbook* is described as suitable "for use in any beginning class, whether college freshmen, high school students, or pupils of upper elementary grades" (p. 2). Approximately one-third of it has to do with phonetics, or the method of production and description of sounds. A second third of the book is occupied with a discussion of elocutionary and rhetorical principles, and a concluding third contains selections for practise in public speaking. Of the second and third sections, nothing need be said except that they have no more to do with American speech than with British or Australian. The subjects discust are general, and of a kind that has long been familiar in the writings and instruction of professional elocutionists.

Concerning the first third of the book, however, a word or two seems called for. It was apparently this part of it which gave a title to the whole. Professor Lewis starts with a description of the organs used in the production of speech, follows this with some account of the sounds themselves, vowel and consonant, of the language, and then proceeds to the discussion of "sounds combined into words" and of "words combined into sentences." It should be noted, how-

ever, that by the time we get over into sentences, very little is said about phonetics.

In the section devoted to the description of separate sounds, the reader soon becomes aware that he must depend to a considerable degree upon his skill at guessing, if he is to follow his author. What is commonly known as a voiceless consonant is said to be "merely a blowing sound," whereas the voiced consonant is a "murmur." Consonants are also hard and soft, but apparently hardness and softness have nothing to do with blowing and murmuring. A description of a sound as "a hard murmured hissing between the teeth," or as "a soft puffing sound thru the lips," is almost meaningless, unless one knows beforehand the sounds intended, in which case the descriptions are unnecessary. Professor Lewis seems to have felt impelled to get along without a phonetic alphabet, but he does so at the expense of making his discussion confused and unintelligible.

But granting the difficulties which an inexpert phonetician must cope with in attempting a popular presentation of so unfamiliar a subject as general phonetics, we may turn for a moment to the part of the *Handbook of American Speech* which is not technical, and which calls merely for a sensitive ear in the observation of the actually existing sounds of American speech. We become a little sceptical of Professor Lewis's powers of observation when we find that he puts gloss, grog, and swan, in the same category (as to vowel sound), as clock, crock, and the like (with the vowel ah); glory in the same category as blow (with oh); broth in the same class as block, and lists block, in a different category from clock, and crock. We are still more puzzled when we find sylph described, as containing "a difficult consonant ending." Is it more difficult than the consonant ending of self? But we soon find that Professor Lewis is often seeing spellings when he thinks he is hearing sounds. For is the final consonant sound of bulge really different from the final sound of ridge (p. 57–58)? And is the final consonant combination of searched really a combination rchd (p. 59), and of wink a combination of nk (p. + 60)? And is it an "error"

(p. 61) to obscure the initial vowel of about, abate, and the like, and is it correct, or customary, in American speech to give this vowel a full and clear value? And does the first syllable of begin, because, etc. (p. 64), really have the shortened sound of *ee*? And is it right to "use a strong and separate stroke of the diaphragm" (p. 66) to insure a clear initial h in her in combinations like heard, her? And must mountain and certain be pronounced moun-tain, cer-tain, not mount-tn, cer-tn? And is there a phonetic difference in American speech in the final syllable of regular, lever, and censor? or of dismal, hovel, civil, trouble? or of sluggard and shepherd? And are of, from (and many other slightly strest words like these) pronounced as they are written, and are uv and frum (Professor Lewis's phonetic representations) wrong?

When we have answered these questions and dozens like them that arise in reading the *Handbook*, we begin to realize that Professor Lewis has not had his eye upon American speech at all. He has not observed the facts. The speech he describes is one that was never heard in America or anywhere else, except from the lips of fantastic professors of elocution and prim school-marms. It is a gross caricature of American speech. Professor Lewis's book should have been entitled *Some mistaken notions as to how American English ought to be pronounced.*

It is perhaps of no importance that another attempt at school-mastering the language should have been made, for this error, like many others, is probably immortal. But it is of some importance that such an attempt should call its particular brand of affectation American speech. Artificial and fantastic speech is not American, and the attempt to pass it off as such, unfortunately, tends to discredit even sensible projects for the improvement of American speech.

GEORGE PHILIP KRAPP

COLUMBIA UNIVERSITY

A Beginner's Psychology. E. B. TITCHENER. New York. The Macmillan Company, 1915. p. 362. $1 00.

The teacher who fancies that the psychology of element, attribute, and pattern can not be presented in a lively and, interesting fashion to beginners should at once acquaint himself with this book. In spite of a constitutional bias against the structuralist's point of view, the reviewer can not resist using the word fascinating as the most appropriate descriptive adjective. The book has none of the patchiness so characteristic of introductory texts in psychology. It was manifestly thought out coherently and completely before it was begun, and it is as clearly worded as it is consistently organized. There is not a tedious page in the volume. The discussion thruout is enlivened by a store of apt and contemporary illustrative instances, series of exercises which for almost the first time in the history of psychological textbooks live up to their name, and a selection of suggestive introductory quotations ranging from Aristotle to Li Hung Chang. Adequate general references are appended to each chapter.

It may appear superficial to begin a review by the enumeration of these details. Nevertheless, since the book is not a polemic but frankly a beginners' text, it is just such details that help distinguish it. The book is designed to supplant the older *Primer of psychology*, but is in no sense a mere revision of this—it is a fresh presentation of the point of view, methods, problems, and typical results of that psychological attitude which the author so vigorously and classically represents. Emphasis thruout is on the scientific point of view, as distinguished from that of common sense and practise. Much is made of the distinction between facts and meaning, value or use. Science, it is insisted, has nothing to do with value, meaning or use.

An introductory chapter defines the task of psychology as the description of "the world as it is in man's experience, as it appears with man left in," a simple, albeit a tantalizing definition. The task of description (analysis and synthesis) is then presented, and the general problems, methods, scope

and varieties of psychology indicated. The succeeding chapters, of about thirty pages each, take up in turn the general topics—Sensation, Simple Image and Feeling, Attention, Perception and Idea, Association, Memory and Imagination, Instinct and Emotion, Action, Thought, Sentiment, Self and Consciousness. An appendix treats of Dreaming and Hypnosis. The treatment of all these topics accords, as fully as is consistent with the purpose of the book, with the method familiar to readers of Titchener's more pretentious volumes. Conspicuous are the elementary processes of sensation, image and feeling, the attributive character of vividness (denied to feeling), the attention types, the structural analysis of perception, idea, meaning, emotion and thought, the law of reduction, the determining neural tendencies (unfortunately called nerve-forces), the constant resort to neurological concepts when analysis and description fail, the substitution of mental accompaniments for consciousness, rejection of the thought element, an equivocal use of the word meaning, the insistence on the student's psychologizing at first hand, and the assumption of his knowledge of neurology. Disputed issues are not prominently featured, and when they are necessarily encountered it is urged that judgment be suspended until all the facts are in.

It may seem ungracious to single out particular obscurities in a presentation characterized by exceptional clarity. Two such points may, however, be profitably indicated, and that with no argumentative intention. It is to be doubted whether the assignment to psychology of "the world as it is with man left in it" facilitates the student's comprehension of the task before him, particularly in the light of what the book contains. Altho little is made of the peripheral sensorimotor features of the nervous system, a heavy burden is thrown on the central aspects—the "directive nerve forces," "psycho-neural processes," "brain-habit," "inherited nervous mechanism," "neural association tendencies," "determining tendencies," and "nerve-forces which show themselves neither in sensation nor in image." In fact, if these neurological

concepts were not employed the results of descriptive analysis and synthesis would be meager indeed. If these matters are not psychological, what place have they in a textbook of the subject? If they are to be conceived as psychological subject matter, or as having psychological interest, how does "the world with man left in it" differ from the world of the chemist, the neurologist and the experimental physiologist? The reviewer, be it said, welcomes the inclusion of these matters in the textbook. They are infinitely more interesting than the analysis of mental patterns. They are also well calculated to interest students in the study of human conduct. If this interest leads them away from the pursuit of patterns, Professor Titchener's inviting exposition thereby acquires the merit which structural psychology loses.

The other comment has to do with the treatment of meaning. The use of the word, it has been said, is equivocal. First, meaning is not a fact (p. 4); next, "meaning is always context; and the context is the fringe of related processes" (p. 118); then, meaning is not process, sensation or image, but something which is "carried by a quiver of the stomach or some muscular set or . . . . . some complex of images" (p. 120). Moreover, "we should probably find that any sensory or imaginal process whatsoever is able . . . . to carry the meaning of any other" (p. 120). There is a further stage "in which meaning is carried not by any sort of sensation or image, but simply by some set or disposition of the brain" (p. 120), a previous context having lapsed. Also, self, may be considered as a meaning, and "any mental process whatsoever may represent the self if its context and determination carry the meaning of selfhood" (p. 315).

Now all this, at least to one reader, is extremely puzzling. If meaning is not a fact, how can it be context, for surely context, as made up of sensory and imaginal processes, is fact. Or, if meaning is not contextual process, but some further non-fact that is "carried" by the context, why should the two have been originally identified? Indeed, meaning, which "is always context" may be present when there is no context but only "some habitual nervous set." The obscurity

grows when, substituting "context" for "meaning," we read, "any sensory or imaginal process whatsoever is able . . . . to carry the context of any other." The obscurity is complete when we read that self, which is a meaning, may be represented by any mental process which in turn has a context which itself carries the meaning of self!

Even the beginner will as usual criticize the naïve experiment of Sherrington and the remotely relevant conclusions of Cannon, with respect to the constitutive and differential elements of emotional experience, and it is curious indeed to find both significantly referred to in the present textbook. The reviewer's students persistently fail to see why the fact that a dog snarled at a cat in spite of section of the vagus and the cord is thought to have any bearing on the analysis of the constituents of emotion, and they fail to see in Cannon's statement more than an additional personal opinion. At best, these data do not illustrate the observational descriptive analysis of the emotive pattern. This, however, is all incidental; such deviations from the strictly structural attitude enhance rather than detract from the value of the book as a text. *A Beginner's psychology* is an unusually readable and illuminating textbook and sets an admirable standard for future introductory manuals of psychology.

H. L. Hollingworth

Columbia University

Essentials of Argument. By Arthur Parker Stone and Stewart Lee Garrison. New York. Henry Holt and Company, 1916. 325 p. $1.30.

The difficulty of contriving a new title in an overwritten field was probably paramount in the minds of the authors of *Essentials of argument*, yet a reading of the book convinces that it was not this endeavor alone which furnished a title so precisely covering their material. In explaining the appearance of another textbook, they announce their opinion that most treatises either seek after novelty or attempt to teach too much; and that they will include only the principles which some years of experience have demon-

strated to be fundamental in teaching the most complex form of English composition. The manual is an admirable exponent of the promised elimination. It is all simplicity and good sense.

These qualities are perhaps illustrated best in its concise and valuable handling of the chief student difficulty, that of getting at the main issues. The dominant trait of student speeches is the cluttering of the points of conflict with trivial and extraneous matter, and matter that should be conceded or waived. The student is taught to discern that matter relevant to the topic may not be so to the contention; that extraneous matter is relevant to the preliminary explanation but not to the proof; that matter which is not vital to the difference of opinion should be either conceded or definitely set aside. This treatment of a troublesome subject commendably relieves it of artificial confusion. The same simplification is shown in considering fallacies chronologically, as it were, rather than logically—that is, according to the places in the reasoning in which they occur. Students are warned that the two fallacies of malobservation and of unjustified assumption may occur in the premise; the three fallacies of hasty generalization, false analogy, and mistaken causal relation may occur in the inference; the ignoring of the question by appeal to passion or prejudice, the shifting of the ground from the original proposition, the shifting of the meaning of words from the sense generally or originally understood, may balk the point at issue in the conclusion. Nor is the customary obfuscation created by futile academic discriminations between conviction and persuasion, as matters important in themselves. Conviction depends on the acceptance of evidence by the audience but persuasion depends upon the personality of the speaker. It consists in pleasing them, and up to the point of seeking to betray their judgment, should demand the efforts of the speaker. Its superficial essentials are good-nature, tact, and good taste; its more underlying qualities are simplicity and sincerity. The final appeal, after the evidence is all in, is naturally the speaker's best opportunity to exercise his

persuasiveness. The survey of the nature and value of evidence is particularly illuminating. Circumstantial evidence is as trustworthy as direct evidence. "The strength of direct evidence lies in the fact that no mistake can be made in drawing the inference, its weakness lies in the unreliability of human testimony; the strength of circumstantial evidence is that it eliminates to a marked degree human fallibility, its weakness lies in the fact that it depends upon the ability of the human mind to reason correctly."

All this is sufficiently indicative of the direct and simple way in which the book realizes its contention. Its good sense is further exhibited in the avoidance of classic material in illustration of its points, except when style is under immediate consideration. Furthermore, the chapters devoted to style are few and equally well handled. In them the desire of the authors not to give too much is perhaps most in evidence and most conspicuously in divergence from other manuals. In the appendix is given an admirable brief and argument on Should Ireland Have Home Rule. This piece of student work serves as a model for other students in writing their own work, and marginal notes refer to the principles discust earlier. An excellent table of suggestions for writing an argument, a list of subjects in the Harvard-Yale and Harvard-Princeton debates since 1892, and fifteen pages of well-chosen exercises in the study of the chapters, increase the practicality of the book.

Thoroly good in plan and execution, it refrains rigidly from purchasing personality at too dear a price. This is a fault into which many manuals otherwise commendable have been betrayed. The insidious enemy of textbooks on student speech-making is the temptation not to follow the advice which the chapters on College Debating and on Delivery in *Essentials of argument* so wisely emphasize. The successful textbook, like the successful speaker, seeks not to make the audience see a person but grasp a thought.

ALGERNON TASSIN

COLUMBIA UNIVERSITY

It is a pleasure to greet any book that is introduced by the accomplished Master of Balliol College. A brief examination of the *Spiritual ascent of man*, by Dr. W. Tudor Jones, seems to justify the Master's statement, that "This book aims at bringing the best philosophical thought of the time within the range of the ordinary reader," and it has succeeded in its aims. (New York: G. P. Putnam's Sons. 1917. 748 p. $1.50.)

Dr. Edwin F. Northrup of Princeton has done a very useful service in adding to existing reference books his *Laws of physical science*. It is a well-arranged collection of the chief laws and principles of physics, so ordered as to be readily referred to. (Philadelphia: J. P. Lippincott Company. 1917. 210 p. $2.00.)

The Open Court Publishing Company, which is to be congratulated on the high quality and good appearance of its philosophical publications, is responsible for an admirably made edition of Leibnitz's *New essays concerning human understanding*. The editor and translator is Alfred G. Langley. It may not be out of place to commend to some modern writers on philosophic subjects who flatter themselves that they are independent of all past experience, the following very pregnant sentence which appears on page 249: "An immortal being or a spirit can not be stript of all perception of its past existence." (Chicago: The Open Court Publishing Company. 1916. 861 p.)

A new textbook for use in colleges is *Essays on logic*, by Assistant-Professor Sellars of the University of Michigan. Formal logic has much more value theoretically and practically than the author is willing to admit. (Boston: Houghton Mifflin Company. 1916. 349 p. $1.60.)

An elaborate study of the modern anthropological type is *The belief in God and immortality*, by Professor Leuba of Bryn Mawr College. There are few subjects as to which statistics can be more meaningless, and that is saying a great deal. (Boston: Sherman, French & Company. 1916. 340 p. $2.00.)

NOTES AND NEWS

Tufts College

The report of President Bumpus of Tufts College, for the calendar year 1916, is an altogether unusual document in size, material, and intention. The report, says the note of transmission to the trustees of the college, "may be summarized by the statement that we have given instruction to a larger number of students than heretofore, purchased a few things that were urgently needed, made certain necessary repairs, increased the teaching staff, paid our bills, and added somewhat to our productive endowment. In order that the present condition of the college and the part that it is taking in providing collegiate instruction may be more readily understood, I have taken the liberty of reducing the text of this report and of submitting in lieu thereof certain comparative tables accompanied by brief explanatory statements. An examination of this material must show that there is a real and a growing demand in this neighborhood for the kind of instruction that Tufts College is giving, that the college is operating efficiently, and that it is worthy of support more nearly commensurate with its usefulness."

The entire report, to carry out this scheme, consists of seven diagrams on as many pages, with a short explanation in each instance of their purpose. The diagrams show in detail a comparison of the enrolments of New England colleges, *viz.*, Harvard, Yale, Massachusetts Institute of Technology, Dartmouth, Tufts, Brown, Williams, Amherst, and Bowdoin, which, according to the figures given, stand in this relative order with a total for Tufts College of 1737; a comparison of the enrolment in the several schools of the college itself, which places medicine in the lead with 588; the productive endowments of the several New England colleges, with Harvard at the top with an endowment of $30,074,000 and Tufts at the bottom with $1,598,000; the condition of the total endowment of the college, which together amounts

to $3,460,000; the total receipts from fees and endowment, in all $291,063, of which $236,845 is received for tuition and only $54,218 from endowment; the total receipts and expenditures, $315,000 for the one and $297,000 for the other, the receipts, accordingly, exceeding the expenditures by $18,000; and, finally, a general diagram showing the distribution of students of the college, 1333 out of the total of 1737 coming from the state and the larger portion of them from the area of greater Boston.

The report serves its purpose of visualizing the actual conditions at hand. The college is more than half again as large as it was in 1911–1912, and in all of the schools into which it is organized, as exhibited by the particular diagram, there is an upward growth. It is to be noted with interest that all special students have been eliminated, and that upon arts courses the attendance has more than doubled in the six years under review. As a plain, unvarnished statement of fact the report with its diagrams could scarcely be bettered. When all presidential reports have arrived at a similar statistical presentation of their affairs, however, we shall only need to call in the temporary services of the efficiency expert to write them, but we shall possibly miss in the process much of the educational stimulus and suggestion that, in the older manner, is still contained in many of them.

Harvard University

The report for the academic year 1915–1916 of the President of Harvard University to the Board of Overseers contains, as usual, in addition to President Lowell's own comments upon conditions affecting the university, both as a whole and in many of its parts, the detailed reports of departments of instruction and the appended treasurer's statement, in all, a document of 563 pages that gives the comprehensive view intended of the workings of the institution.

President Lowell calls attention to the fact that for the first time, in the period under review, Harvard has ceased to give separate entrance examinations, and has adopted the

College Entrance Examination Board papers for both the old and new plans. One of the most interesting things done in the college, says the report, during the last few years, has been the invitation given by the Department of Economics to the Department of Education to investigate the undergraduate instruction in economics with a view to its possible improvement, an investigation that is under way, but the results of which have not yet been published. The fundamental questions in all education, President Lowell reminds us, are the object sought and the result obtained. The particular question that the enquiry is intended to answer is whether economics is studied in college for the sake of its general educational value in training the mind and preparing for good citizenship, or with a view to its vocational utility in the student's subsequent career; and how far it actually fulfils each purpose. "If the chief value of economics," the report continues, "is vocational, it ought to be taught mainly from that point of view, and undergraduates ought not to be generally encouraged to elect it who will not pursue some vocation to which it leads. If, on the other hand, its principal benefit lies in training men to think clearly, and to analyze and sift evidence in the class of problems that force themselves upon public attention in this generation, then the greater part of the course ought to be conducted with that object, and it is well for every undergraduate to study the subject to some extent." It is very apparent that economics is not the only subject of instruction in the college that might be scrutinized from these same points of view, and it would no doubt be interesting to see what, in the end, would appear to be largely vocational and what of general educational value, if the whole course of study of the ordinary college were to be weighed and classified. The report does point out that the traditional path to eminence at the English bar has been at Oxford the honor school in *literæ humaniores*, and, at Cambridge the mathematical tripos, which is cited in support of the proposition that students naturally follow the prevailing view of the value of subjects of instruction, without the means of testing its correctness. What

it really indicates, however, is that both at Oxford and at Cambridge minds are trained thru an educational system that educates and does not merely instruct in this or that or the other thing, either with or without a view to its direct and immediate application to a future calling. The Department of Education dealt also in their enquiry with the relative value attached by students to the various methods of instruction; *viz.*, lectures, class-room discussion, assigned reading, reports, essays or theses prepared by the students, and other less prominent agencies. As a whole, the students, states the report, ascribed distinctly the greatest value to the assigned reading, the next to the class-room discussion, with lectures decidedly third, and reports and other exercises well below them.

A forceful and wholly logical stand is taken in the report against the undue multiplication of courses of instruction, which it says with truth is a question which affects the whole university policy in this country. A university, it is stated, as its name implies, is an institution where all branches of learning are studied, but this principle easily transforms itself into the doctrine that a university ought to offer systematic instruction in every part of every subject. No European university attempts to do this; and the report rightly sees in this increase of courses, altho it may not always be consciously recognized by departments or individuals, the desire to attract students, from the fact that American graduate students tend to select their university on account of the number and richness of the courses listed in the catalog, rather than for any other reason. A careful scrutiny of courses at Harvard, it is concluded, would show that there were few, if any, that could be seriously considered as useless or superfluous in themselves, and the touchstone could undoubtedly be applied in other places with a similar result. It is a proper subject of consideration, says the report dispassionately, whether the policy of offering courses covering every part of every subject is wise. It might have been stated with conviction that it is decidedly unwise. "Fewer courses, more thoroly given, which would free instructors for

a larger amount of supervision of the students," the report affirms, "would be better for the pupils; and would make it possible for the university to allow those members of the staff who are capable of original work of a high order more time for productive scholarship."

An urgent plea is made for more endowment, "if Harvard is to maintain its rank among American institutions of learning."

General Education Board

The report of the Secretary of the General Education Board for 1915–1916, which has escaped notice in these pages, contains the usual statement of the work of the Board for the period under consideration together with the detailed report of the Treasurer.

In carrying out its project of assisting "such institutions of learning as the Board may deem best adapted to promote a comprehensive system of higher education in the United States," conditional appropriations have been made to Carleton College, Northfield, Minn., Hobart College, Kalamazoo College, Lafayette College, Colby College, Waterville, Me., Maryville College, Tenn., Coker College, Hartsville, S. C., Milwaukee-Downer College, Western College for Women, Oxford, Ohio, and Rockford College, Ill., in all $900,000, toward a total of $4,100,000 which the institutions have undertaken to raise.

At the present time the Board is cooperating with no less than fourteen Southern states in farm demonstration, and in secondary and rural education. In medical education, in addition to the large gifts already made to Johns Hopkins University, Washington University, and Yale, the Board is aiding in the creation of the Medical Department of the University of Chicago. It has under way, with the intention of speedy publication, a number of studies and investigations of widely different kinds: the technique of reading and handwriting; college and university accounting; the Gary Schools; the work and influence of Hampton Institute, which as the

report states, is not only an institution of peculiar importance in the education of the negro, but may properly be viewed as an experiment station in the field of general education; the organization and operation of Tuskegee Institute; the training of teachers for rural schools; the exceptional child; and the junior high school.

The Board made, in 1915, an appropriation of $5,500 to the New Hampshire State Superintendent of Education for the purpose of establishing a Bureau of Research which has undertaken investigations in efficiency in reading; the amount of arithmetic needed to meet actual social demands (*sic*); and tests in handwriting, Latin, French, typewriting, and stenography. The investigation in reading has extended from the third grade of the elementary school thru the secondary school and the first two years of the normal school. "Marked differences in ability to read have been disclosed; not infrequently third grade children are found to read better than average eighth grade children; yet under current practise these unusually competent third grade children are kept under formal instruction, to the waste both of their own time and the public money. It appears to be open to question how much good is accomplished by formal instruction in reading after the third or fourth grade. Should these preliminary results be sustained by further experiment and investigation, one-fifth of the ordinary child's school time during five school years may be saved."

"The investigation in arithmetic," says the report, "aims to ascertain just what and how much arithmetic the ordinary man needs to know"—a matter, plainly, that will make it necessary, first of all, to discover the ordinary man. A bulletin is almost ready for publication describing a test of the ability of the average pupil, after four years of study, to translate and interpret a passage of ordinary Latin, which is expected to answer the question whether the prolonged study of grammar yields any actual capacity in the direction of the functional use of grammar in translation.

"In connection with the research work which it is now assisting, the attitude and purpose of the Board," it is stated

with emphasis, "should be clearly understood. The Board makes appropriations to competent investigators without making itself in any wise answerable for their findings. From time to time their results will be stated in reports or separately published, but the investigators are alone responsible for them. The Board supports the research movement, not because it is concerned to advocate any special educational procedure, but in order that it may give to workers of recognized standing the facilities needed for the prosecution of their researches. The movement has indeed already borne fruit; for school results and methods are being scrutinized as never before. A new attitude toward innovation is also developing. In a word, the scientific attitude is permeating education, questioning proposed innovations not less than established traditions." "A more effective and more economical education," concludes the report, "should ultimately result." To such a desired consummation all of us, whatever may be our inherent convictions about the ends and aims of education and the proper means to further and secure them, will fervently say Amen.

Legislation in New York

Bulletin 623 of the University of the State of New York contains the acts past by the Legislature of 1916, affecting generally the educational interests of the state, together with amendments to the educational laws, to the charter of the City of New York relative to schools and education, and to the public health law relating to professional education and practise. Various acts and parts of acts of general interest concerning the administration of school affairs are also included. Bulletin 579, containing the Educational Laws as amended to July 1, 1914, and Bulletin 598, containing the educational legislation of 1915, together with the present pamphlet, comprise substantially all the laws pertaining to education in the state.

Particular attention is called to the two inter-related acts, providing, in the one case, for physical training and discipline in the schools, and, in the other, for military training outside

the schools, concerning which in their first promulgation there was a vast amount of misunderstanding and ill-founded comment. Chapter 567 of the Laws of 1916 provides, in substance, that after the first day of September, 1916, all pupils above the age of eight years in all elementary and secondary schools shall receive as part of the prescribed course of instruction such physical training as the Regents, acting thru the Commissioner of Education and in conference with an appointed Military Training Commission, may determine, during periods which shall average at least twenty minutes in each school day. Chapter 566 provides that after the same date all boys above the age of sixteen and not over nineteen (except those exempted by the Commission) shall be given such military training as the Commission may prescribe, for periods aggregating not more than three hours in each week during the school or college year; a system of field training is also provided. Other acts contained in the pamphlet pertain largely to matters of administration and do not materially change existing educational policy.

Vigorous Speech

Senator Saulsbury of Delaware, who as president *pro tem* of the Senate presented to that body Viscount Ishii, special envoy from Japan, used some exceptionally vigorous and trenchant speech. This paragraph is particularly noteworthy:

"The yellow peril was made in Germany, and Shantung was seized. The Slav peril was made in Germany, and Serbia was overwhelmed and Russia invaded. But the thick-witted, smug, self-centered supermen of Germany entering their last attempt at conquest have roused a real peril—a real peril to themselves—and the free nations who believe in international honor, in the binding force of treaties, and in the pledged word are grimly tho so sorrowfully engaged in creating, perfecting, and bringing to successful issue an alliance for the benefit of all earth's people which will protect the rights of nations, small and great, and enable them to lead their lives in peace and lead them unafraid."